Volume 93 Number 8

STEEL

For forty-eight Years—IRON TRADE REVIEW

PRODUCTION • PROCESSING • DISTRIBUTION • USE

The Week in Perspective

WITH the outcome of the steel and coal codes in doubt throughout most of the week, the industry was in a quandary over business prospects. Evidence of the retarding influence of NRA uncertainties was found (p. 15) in a 3-point recession in the rate of steel operations to 51 per cent of capacity. Concern over its precipitate decline was tempered somewhat by the appearance of a number of large projects (p. 35) for early bidding which will require more than 200,000 tons of steel in the aggregate. Other encouraging factors were the prospect of heavier railroad purchasing (p. 40), development of attractive pipe business (p. 44) and better volume (p. 17) in automotive specifications.

Steel Wins Point, But Unions Publicize It

Resumption of negotiations on the steel code last Tuesday was enlivened by a clash between employers and union labor when William Green (p. 13) attempted to sit in a conference of steel company presidents and NRA officials. Steel won its point, but labor utilized the incident to further incite public opinion against the steel industry. Silence on the part of the voice of steel on this and other occasions (p. 20) has placed the industry's policy of public relations under fire. Steel's leaders are urged to appreciate more fully the power of public good will and to correct their gun shy attitude in dealing with the daily press.

Code Situation Entering Critical Period

Executives of the oil industry, failing to agree upon a code, had a chance Thursday to look (p. 13) upon General Johnson's handiwork. Coal operators (p. 11), engulfed in numerous differences, faced the threat that NRA would write their code. Automobile manufacturers (p. 11) tried to inject an open shop statement into their pact. NRA sharpshooters challenged it. Smaller groups (p. 12) continue to organize and to perfect codes. The recovery program is entering a critical period (p. 21), when the final outcome of the steel, oil, coal and auto pacts will shape the course of business.

U. S. Steel Favors Individual Steel Houses

The long awaited booklet of the United States Steel Corp. on "Steel Framing for Small Residences" has been published. It gives evidence (p. 16) that the largest producer will cast its lot in the steel building field with houses of individual nonstandardized design; for the moment, at least, the corporation does not look with favor upon the mass production house. It looks to architects, builders and local

Stainless steel becomes an artist's canvas by skillful use of a pattern, lampblack and sandblasting. This figure is at the stairhead of the Union Carbide & Carbon exhibit at the Century of Progress exposition. Albert A. Aster was the artist, using Republic Steel Corp. steel

fabricating shops as the natural and promising avenue of exploitation for the steel house. . . . Return of idle workers to employment has brought forth a new problem. In certain districts greedy creditors (p. 10) are attaching the first wages of re-employed men. Counsels of steel companies are seeking a remedy for the situation. . . . Some of the smaller steel producers (p. 16) show marked improvement in their financial statements.

Formula Gives Measure of Roll Pressure

Attempts have been made to establish formulas by which actual rolling pressure in hot rolling mills could be calculated, but with no great success. Such a formula, properly established, would be applicable to any rolling schedule, regardless of mill size, and after intensive study a Swedish engineer has propounded a formula which appears to be the most reliable yet published. A series of weekly articles in STEEL, beginning on page 27 of this issue, will relate how this formula was developed and other factors influencing hot rolling practice. . . . In roll grinding, it is of utmost importance that common faults such as flats, chatter, grit and traverse marks, be not covered up (p. 30) by a wheel that is limited to a polishing action.

Keeping an Eye Open for Workmen's Safety

Development of suitable goggles has done much to eliminate the danger of iron and steel chips flying into the eyes of workmen engaged in chipping and grinding, but occasionally goggles will fail to do this, and for such an emergency a magnetic instrument has been developed (p. 32) which effectively removes iron and steel particles lodged in eyes. . . . Reports indicate that accident frequency and severity rates in certain branches of the metals industry increased in 1932. Concentrating upon this unfavorable development, the annual safety congress and exposition of the National Safety council in Chicago, Oct. 2-6, will consider present-day industrial hazards and methods to combat them.

New Refinements in Control Methods

Speed-torque curves provide definite signposts to guide the adjustment of series motor resistors used (p. 23) in connection with hoist, trolley and bridge controls on cranes. . . . In another type of control—regulating the flow of fuel in oil-burning boilers—the photo-electric cell is vested with the responsibility (p. 30) for shutting off the oil supply if the burner flame should be extinguished inadvertently. A similar light-sensitive control is used in a cold strip mill (p. 32) to actuate the drive of a reel on which the strip is wound as it emerges from the mill.

The VOICE of INDUSTRY

Communications appearing here do not necessarily reflect the opinion of STEEL *or of its editors.*

Attachment of Workers' Wages a Problem

To the Editor:

The attached clipping from a Wheeling paper refers to a situation which presents a serious problem in districts where workers, long out of work, recently have been put back on the payroll.

Isn't there a way to prevent greedy creditors from snatching away the first few dollars a re-employed man earns?

WEST VIRGINIA EMPLOYER.

NOTE: The article referred to above, an editorial entitled "The Attachment Puzzle" in the Wheeling News, follows:

"The Wheeling Steel Corp., the Weirton Steel Co. and other large companies have experienced a great deal of difficulty in the last few weeks with the avalanche of attachment proceedings against their employes' wages, issued from squires' offices. In many cases, men who had not worked for many months found their first pay attached by some particularly hungry creditor.

"Men should pay their debts, of course, and nearly every man will if given a chance. However, crowding them too hard at the very renewal of their income does more harm than good, to debtor and creditor alike. Most of these people now returning to work have long standing bills for groceries, rent and other necessaries. They should be allowed to spend their money as widely as possible. The indulgent creditor has just as proper a claim as the legal-minded skinflint. The debtor should, at least, be given the opportunity to form a plan and tell all his creditors what he expects to do.

"Counsels for the big corporations are giving this puzzle their attention, and the more enlightened squires are cooperating with them. A more moderate and humane practice of garnishee protection will probably result."

Financing for Small Manufacturers

To the Editor:

"Foundry President," writing under the title "New Deal in Credit Essential," on page 8 of the July 31 issue of STEEL, outlines a situation which is of great concern to thousands of employers.

Manufacturers with whom I have discussed the problem of credit in connection with the recovery program are disturbed over the apparent necessity of meeting increased expenses at a time when operations are in red ink, credit is unavailable and reserves, if any, are at the vanishing point.

Moreover some small employers, should they be successful in borrowing from a bank, are forced to pay at the rate of 12 to 15 per cent interest per year. If they resort to this practice to any extent, it will be impossible to live through many more months of red ink.

More letters like "Foundry President's" would help politicians and the public at large to understand what the small employer is up against.

ILLINOIS MANUFACTURER.

Steel Code Conferees Reach Impasse; Outcome in Doubt

LATE Friday the fate of steel's code of fair competition was undecided. A deadlock between steel representatives and NRA officials, which terminated negotiations at midnight Thursday, had not been broken.

Steel executives voiced the opinion that "it was NRA's next move." From administration spokesman came assurances that the differences could be settled. President Roosevelt, late Friday, stated that he had not gone into the steel code situation thoroughly but he hoped that the code would be presented to him before he departed for Hyde Park Saturday night.

Deputy Administrator Kenneth M. Simpson, who has divided his attention between the steel and coal negotiations, declared that NRA is not rewriting the steel code. General Johnson, at his press conference Friday morning, still entertained hope that the deadlocked steel and NRA conferees would get together sometime during the day. Throughout official circles in Washington was a growing belief that the conflict over the code would be adjusted through the White House.

Administrator Johnson hinted that the disagreement which brought the negotiators to an impasse concerns hours and wages. This was denied by steel men. From other sources came the statement that the deadlock was caused by disagreements on wage districts.

As originally drafted the code provided for 21 wage districts with wages ranging from 25 and 27 cents per hour in the south to a maximum of 40 cents in the north. On July 31, while the hearing was in progress, southern producers agreed to raise the minimum wage for their districts to 30 cents.

Reduce Number of Wage Districts

It is understood that in the conferences during the past week the number of districts was whittled down to six. On Friday it was reported that NRA was insisting upon a further reduction to three.

While it was evident that General Johnson preferred to push the steel code through ahead of the coal pact, circumstances seemed likely to reverse the order. With 29 coal codes submitted by the bituminous operators, it has been apparent from the first that the coal industry would be unable to agree upon a single code. Therefore, NRA Friday was engaged in writing a code for coal, to be presented to operators later in the day and to be sent to President Roosevelt Saturday.

This proceedure in coal, if followed will be identical with that pursued in handling the oil code. The petroleum interests having failed to agree among themselves, NRA wrote a code for them, showed it to the oil men at 5 p.m. Thursday, and gave them until 10 o'clock Friday morning to file comments on it.

Several companies, names of which were not divulged, registered objections to the price regulating features of the rewritten code.

Examine Statistical Data for Code

The resumption of conferences on the steel code last Tuesday was marked by an unexpected complication when William Green, president, American Federation of Labor, attempted to sit in the meeting. After considerable delay, during which time Mr. Green withdrew (see page 13), the conference was resumed.

The steel industry was represented in the conference by a committee of five, consisting of W. A. Irvin, president, United States Steel Corp.; E. G. Grace, president, Bethlehem Steel Co.; Tom Girdler, president, Republic Steel Corp.; L. E. Block, president, Inland Steel Co.; and Hugh Morrow, president, Sloss-Sheffield Steel & Iron Co. Also in attendance were Robert P. Lamont, president, American Iron and Steel institute; E. T. Weir, president, National Steel Corp.; and W. J. Filbert, comptroller, United States Steel Corp. Counsel for steel were Judge Hoyt Moore, counsel for Bethlehem Steel Co. and Nathan L. Miller, counsel for United States Steel Corp.

Representing NRA were Deputy Simpson; Chief Counsel Donald Richberg; Dr. Leo Wolman, chairman of the labor advisory board; Secretary of Labor Perkins, in the capacity of adviser to the labor board; and J. V. W. Reynders, adviser to the industrial advisory board. General Johnson was in the opening session for a brief period.

Much of the time consumed during the conferences on Tuesday, Wednesday and Thursday was spent in correlating and reconciliating statistics on the number of individuals attached to the steel industry, the number of workers who should be re-absorbed into the industry and the degree of purchasing power developed under the different proposed schedules of hours and wages.

The statistical work has been under the direction of W. J. Filbert, representing the steel industry; Dr. Alexander Sachs, statistician for NRA, representing General Johnson; and Dr. Isador Lubin, statistician for the department of labor, representing Secretary of Labor Perkins.

Open Shop Clause in Auto Code

Representatives of the automobile industry were in Washington during the week engaged in negotiations preliminary to the hearing on Friday. In the original draft of the code the following paragraph was inserted after the usual re-statement of collective bargaining from Section 7a of the act:

"In accordance with the foregoing provisions, the employers in the automobile industry propose to continue the open shop policy heretofore followed and under which unusually satisfactory and harmonious relations with employes have been maintained."

On Thursday, the day before the scheduled hearing, the foregoing paragraph was revised to read:

"Under the foregoing provisions, the employers in the industry may continue the open shop policy under which the selection, retention and advancement of employes will be on the basis of individual merit without regard to their affiliation or non-affiliation with any labor or other organization."

On Friday when the automobile code hearing was called to order by Deputy Administrator Col. Robert W. Lea, General Johnson commented on the spirit of co-operation manifested by the automobile industry. However, he stated that "It is a matter of regret that the recommended code does not include 100 per cent of the manufacturers, and I hope that condition will not long continue."

The code presented by the industry provides a minimum wage ranging from 41 to 48 cents an hour and an average week of 35 hours, with a maximum of 48 hours in seasonal periods.

William Green, president, American Federation of Labor, presented union labor's cut-and-dried, standard demand for a 30-hour week and minimum pay of 60 cents per hour. As expected, NRA officials asked the manufacturers to withdraw the reference to the open shop in the revised paragraph presented above.

Fabricators Approve Code; Submit It for Hearing

A tentative code of fair competition was approved by the structural steel fabricating industry meeting in Pittsburgh Aug. 16. The meeting was

called by the American Institute of Steel Construction, and was attended by over 100 individuals representing approximately 80 per cent of the industry.

Terms of the code will not be divulged publicly until after an informal conference with General Hugh S. Johnson in Washington.

The committee responsible for drafting of the code consisted of Clyde G. Conley, Mt. Vernon Bridge Co., Mt. Vernon, O., president of the American Institute of Steel Construction; G. H. Blakeley, McClintic-Marshall Corp., Bethlehem, Pa.; C. Edwin Michael, Virginia Bridge & Iron Co., Roanoke, Va.; W. M. Wood, Mississippi Valley Structural Steel Co., Decatur, Ill.; R. P. Hutchinson, Bethlehem Fabricators Inc., Bethlehem, Pa.; and L. A. Paddock, American Bridge Co., Pittsburgh.

In addressing the meeting, Mr. Conley explained that the institute had appointed the committee to draw up the code, having taken this step as a duly constituted spokesman for its 164 company members. Mr. Conley will confer with the NRA immediately now that the tentative code has received endorsement of a majority of the industry.

It is proposed that a supervisory control of the industry will be exercised through the board of directors of the institute.

Pressed Metal Institute In Reorganization

To enable it to function more advantageously in connection with NRA and to serve an expanding membership, Pressed Metal institute has effected a reorganization. Meeting in Cleveland Aug. 17, its executive committee approved a new constitution and by-laws and referred them back to the board of directors.

The institute is affiliating itself with the recently formed Metal Products Fabricating Federation which is formulating a master code for the entire metal industry except machinery. The executive committee of the institute approved the constitution and by-laws of the federation and also its latest code, although making certain suggestions as to points relating specifically to the pressed metal field.

Ernest H. Wildt, assistant treasurer, Motor Wheel Corp., Lansing, Mich., was named president of the institute at a meeting of the board of directors on Aug. 8. Henry R. Naylor, vice president, Seymour Products Co., Seymour, Conn., was chosen vice president, and Malcolm Baird, 232 Delaware avenue, Buffalo, will continue as executive secretary and treasurer.

The president and vice president with the following five directors will constitute the executive committee: A. J. Watson, secretary, Youngstown Pressed Steel Co., Warren, Pa., chairman; R. F. White, vice president, Mullins Mfg. Corp., Salem, O., vice chairman; Harry C. Senour, secretary-treasurer, Transue & Williams Steel Forging Corp., Alliance, O.; Harry Woodhead, vice president, Pressed Steel Division, Truscon Steel Co., Cleveland; and Charles Paeschke Jr., vice president, Geuder Paeschke & Frey Co., Milwaukee.

In addition to these, the following are serving on the board of directors: W. H. Townsend, vice president, New England Pressed Steel Co., Natick, Mass.; Earl W. Hamlin, secretary-treasurer, Akron Selle Co., Akron, O.; G. F. Alderdice, president, Commercial Shearing & Stamping Co., Youngstown, O.; H. W. Mitchell, president, G. F. Mitchell & Sons Co., Cleveland; and W. H. Schomburg, vice president and general manager, Bingham Stamping & Tool Co., Toledo, O.

Officers report many applications for membership are being received. Minimum dues have been established at $25 per year.

Press Builders Organize; Seek MAPI Membership

Representatives of mechanical press manufacturers met in Detroit Aug. 3 and organized the Mechanical Press Builders' association. Decision was reached by the group to apply for membership in the recently established Machinery and Allied Products institute.

Officers of the association were elected as follows: President, H. U. Herrick, president, V. & O. Press Co., Hudson, N. Y.; vice president, George R. Munschauer, president, Niagara Machine & Tool Co., Buffalo; treasurer, W. C. Sayle, vice president, Cleveland Punch & Shear Works Co., Cleveland; and secretary, Curtis T. Ziegler, vice president, General Machinery Corp., Hamilton, O. Temporary headquarters will be maintained at the secretary's office, 227 Curtis building, Detroit.

At the moment, the association has no board of directors, it being undecided as to whether there will be one. Questions of immediate concern are being discussed by a committee consisting of L. H. Carter, E. W. Bliss Co., Toledo, O., chairman; John F. Herkenhoff, Minster Machine Co., Minster, O.; F. K. Simmons, Henry & Wright Mfg. Co., Hartford, Conn.; and the previously named officers.

Chicago Warehouse Code Body Organized

A. C. Castle, president, A. M. Castle & Co. is president of the Chicago chapter, American Steel Warehouse association, which has been formed for the purpose of guiding steel distributors under the national recovery program. H. B. Ressler, Joseph T. Ryerson & Son Inc., and vice president of the American Steel Warehouse association, is secretary-treasurer of the Chicago group. Five vice presidents have been named to head committees on various steel products. These include: Hot-rolled steel, Charles Heggie, Scully Steel Products Co.; sheets, S. T. Scott, Wheeling Corrugating Co.; tubular products, S. M. Roberts, C. A. Roberts Co.; stainless and alloy steels, Walter Monroe, Chicago Steel Service Co.; cold finished steel, W. C. French, Steel Sales Corp.

Early Delivery Sought on Naval Vessel Material

Public works administration at Washington announces that following placing of contracts for naval vessels early delivery will be accepted on auxiliaries, standard fittings and other materials not immeiately needed, in order to create work at once.

This is expected to promote employment in the manufacture of pumps, motors, fans, blowers, airports, watertight doors, hatches, electrical fittings and other equipment. This decision is taken to avoid the usual delay in waiting until the material is needed for installation, in the endeavor to put as many men at work immediately as is possible.

New Furnaces Installed

Pittsburgh Lectromelt Furnace Corp., Pittsburgh, is installing a top-charge Lectromelt furnace at the United States navy yard at Portsmouth, Va. It has capacity for five to six tons of cold scrap per hour. It will be used for production of alloy and special steel castings and forging ingots. It is the second furnace of this maker installed at this yard. The company is also installing a 500-pound furnace in the plant of the Adirondack Steel Foundries Corp., Watervliet, N. Y., for production of alloy steel castings. This is the third such furnace in this plant, the others being of 5-ton and 1500-pound capacity.

Institute Meeting Set

The British Institute of Metals will hold its twenty-fifth autumn meeing in Birmingham, England, Sept. 18-21. "Tweny-Five Years' Progress in Metallurgical Plant" will be the title of the twelfth autumn lecture to be presented by W. R. Barclay, vice president of the institute.

WINDOWS OF WASHINGTON

WASHINGTON

Full Speed Ahead on Codes

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Mr. Green's Status Confusing

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Teeth in Federal Contracts

RETURN of President Roosevelt to Washington from Hyde Park was the signal for a new spurt of speed on the codes of the major industries. By midweek the presidential pressure for prompt action was terrific. By Friday NRA officials were in the mood to move heaven and earth in order to clean up the steel, coal and oil codes by Saturday night, when the President was scheduled to return to the summer White House on the Hudson.

Typical of the high-pressure tactics invoked by NRA to speed action was the handling of the oil code on Thursday and Friday. The industry having failed to agree upon a code, Administrator Johnson wrote one for it. He presented his handiwork to the oil men at a brief but dramatic meeting late Thursday afternoon.

Seated behind a table laden with multigraphed copies of the rewritten code, General Johnson addressed the 200 oil executives as follows:

"This is the code that in my capacity as administrator I am going to recommend to the President of the United States. He has been over it with me, and so has the department of the interior, and we are in agreement.

"I am going to present it formally to the President tomorrow afternoon with my recommendation, to govern the oil industry.

"I will now distribute copies. We will receive written memoranda up to 10 a. m. tomorrow, and any representations that you care to make after reading and studying the code, may be made.

"I have nothing more to say except to distribute the code."

The code provides for price regulation, a point of controversy among oil executives. Large eastern corporations, including Standard of New Jersey, opposed price control. Western independents favored it.

It is possible that if a deadlock should occur in negotiations on the steel code, NRA would step in and write a code for steel as it did for oil. However, there is one significant difference between the situation in steel and that in oil, and in coal.

The steel industry has presented one code, to which 95 per cent of the industry has agreed. Oil companies, split into factions, were unable to agree on a code. The coal industry submitted 27 codes, and recently introduced two more. Some close observers feel that steel's united front —its solidarity—will be an important advantage in the final negotiations.

UNION labor tried hard to make capital out of the Green incident. Union leaders declared that the "walkout" of steel company presidents constituted an affront to the federal government. They did their best to inflame public opinion into resentment against the steel industry. Some of the newspapers swallowed this propaganda—hook, line and sinker.

While the labor principals were trying to work themselves into an emotional state of outraged dignity, government officials remained calm. They refused to be tricked by labor's show of hysteria.

This is what happened, with unessentials omitted: Mr. Green appeared in the room where representatives of steel and NRA were conferring upon the code. The proceedings came to an abrupt halt. Several of the steel men advised the NRA principals that steel's representatives could not continue to sit in the session if Mr. Green were present. The steel contingent withdrew, accompanied by a few administration officials.

The aversion of the steel company presidents to sitting with Mr. Green was due to several factors. First, they object to the methods employed by the unions in attempting to organize steel company employes before the code is adopted. Secondly, they knew that as soon as word were received in mill towns that steel company presidents were sitting in conference with Mr. Green, union organizers would place an improper interpretation upon the event. They would say to steelworkers, "See, your bosses and our boss are getting their heads together. Your bosses are recognizing our union." Steel leaders pointed out that steel company employes would not be able to differentiate between Mr. Green's status as head of A. F. of L. and his appearance as a member of the NRA labor advisory board. To the average worker, Mr. Green is the symbol of union labor.

These complications were explained carefully to the administration officials, who, while frankly questioning the logic of the explanation, pursued conciliatory tactics. Mr. Green departed. After a long delay, the conference reconvened.

The labor chief lost no time in reporting the incident to the labor advisory board. Later, face flushed and excitedly, he unburdened his grievance to newspaper men. They sought explanations from Secretary Perkins, who maintained a discreet silence. The steel men did not talk.

Shortly after five o'clock, when General Johnson arrived late for his press conference, he was bombarded with questions about the Green episode. He intimated that he knew very little about it, that it was Miss Perkins' party and that she should do the talking. Pressed for a statement as to Mr. Green's status on the steel code, the General declared that Green appeared at the hearing in the role of a witness. The labor advisory board's adviser on the steel code is Miss Perkins, he maintained, and her position is similar to that of Mr. Reynders, who is the industrial advisory board's adviser on the steel code.

At this point, a newsman reported that Mr. Green had claimed he is the labor advisory board's adviser on the

steel code. The General repeated that he thought Secretary Perkins was the labor adviser on steel. "I may be wrong on that," he said. "If I find I am I will correct it, but I'm willing to bet I'm right."

Later he issued this statement:

"My understanding was that Miss Perkins was labor adviser on the steel code. I had been so informed by Mr. Simpson and Miss Perkins. I had not heard of the selection of Mr. Green as adviser when I was asked about it at the newspaper conference today, and therefore assumed that it was an error. I now find that he was named by Chairman Wolman of the labor advisory board on July 31, the day of the hearing. Miss Perkins had been named several days before and indeed had gone on a tour of the steel industry in preparation to act as such."

Parenthetically, it may be recalled that Dr. Wolman once was associated with the Amalgamated Clothing Workers of America. Why did he make an eleventh-hour appointment of William Green as labor adviser, after the Secretary of Labor already had been selected and had engaged in elaborate preparations to fulfill her duties as adviser? Industry may be pardoned for wondering whether union labor tried to "rig the jury." One also may ask, "Inasmuch as General Johnson—soul and body of NRA—was confused over the exact status of the ambitious Mr. Green, is it not reasonable that steel executives might entertain doubts as to the right of the labor chief to sit in their councils?"

FEW observers of government activities seem to have grasped the significance of President Roosevelt's executive order which stipulates that contracts for government work shall be carried out in accordance with an "applicable" NRA code. The important parts of the executive order, which was mentioned in "Windows of Washington" last week (page 15, Aug. 14 issue of STEEL), follow:

"The contractor shall comply with all provisions of the applicable approved code of fair competition for the trade or industry or subdivision thereof concern, or *if there be no approved code of fair competition for the trade or industry or subdivision thereof concerned, then with the provisions of the President's re-employment agreement (blanket code) promulgated under section 4a of the foregoing act (NIRA), or any amendment thereof, without regard to whether the contractor is himself a party to such code or agreement.*

"Provided that where supplies are purchased that are not mined, produced or manufactured in the United States the special or general code of fair practice shall apply to that portion of the contract executed within the United States.

"If the contractor fails to comply with the foregoing provision, the government may by written notice to the contractor terminate the contractor's right to proceed with the contract, and purchase in the open market the undelivered portion of the supplies covered by the contract, *and the contractor and his sureties shall be liable to the government for any excess cost occasioned the government thereby.*"

A strict interpretation of this order would mean that a steel producer or steel fabricator, for instance, who receives a government contract before his industry's code is approved, would be required to comply with the PRA or blanket code in order to proceed with the contract. If this interpretation is correct, then it may be assumed that the President's executive order was issued with a view of speeding up the adoption of codes for the important industries. Support for this assumption is found in the timing of the order; it was dated Aug. 10, at which time spokesmen for the administration daily were intimating in public statements that the major industries were "holding back."

In fairness to the steel industry, it should be recorded here that while the newspapers were feeding the public with sensational statements of what would happen to steel producers if they did not hurry to get their code approved, the steel executives were waiting impatiently—absolutely powerless to do anything until NRA had completed its study of the code and of the testimony presented at the hearing. No criticism of NRA is implied; time was required for its examination of the extensive material involved. But as a matter of decent treatment, certain spokesmen for the government might have called a halt on chastisement of the steel industry publicly—at least during the period when it was waiting for NRA to finish its job.

BACKGROUND of deputy administrators recently assigned to industries: Col. Robert W. Lea, who presided at the hearing on the automobile industry code beginning last Friday, was in the purchase storage and traffic division of the general staff of the army during the war. Later he became president of the Moline Implement Co., afterwhich he was president of Lea Fabrics Inc., Newark, N. J. During the past three years he was with the Continental National Bank & Trust Co., Chicago.

Deputy Philip C. Kemp, who has been assisting NRA on the oil and other codes, has been practicing law in New York during the past 14 years. He was in the army in the war. He attended Colorado School of Mines and Columbia university.

Deputy Harry O. King, assigned to steel and nonferrous metals of all kinds and recently active on codes for metal fabricators, is a Chicago manufacturer and banker. He has been associated with H. E. Talbott Co., New York; Bassick Mfg. Co., Bridgeport, Conn.; and H. O. King Co, Chicago.

Addis E. McKinstry, first vice president, International Harvester Co., Chicago, has been appointed by Edward R. Stettinius Jr., liaison officer between the industrial advisory board and NRA, as adviser to NRA for the automobile industry. Mr. McKinstry will take the place of Charles W. Nash, appointed last week, who is unable to serve on account of sickness. Mr. Stettinius has named Herbert Eisenhart, Bausch & Lomb Optical Co., Rochester, N. Y., as adviser to NRA for the optical industry.

Johnson Wants More No. 1 Men for NRA Service

BELIEF of Washington observers that NRA is undermanned was confirmed Thursday when President Roosevelt and General Johnson began casting about for high grade executives for the recovery staff. They asked Matthew S. Sloan, former president, New York Edison Co., to join the NRA organization.

'We've got to have some more No. 1 men," declared the NRA administrator.

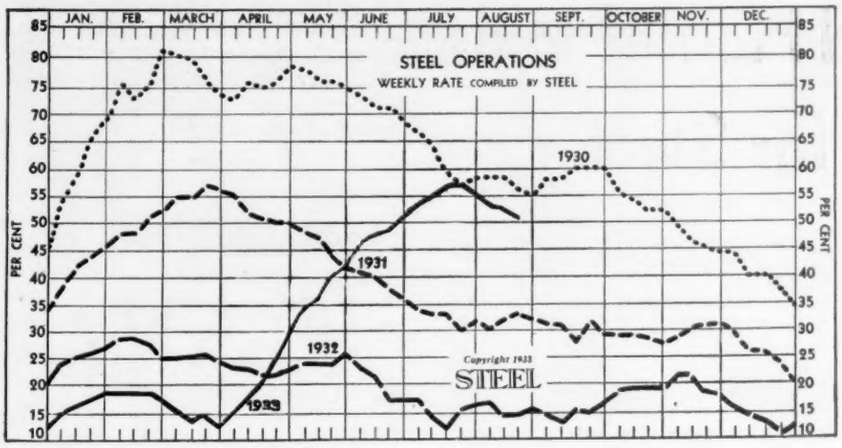
Several weeks ago, in commenting on the qualifications for deputy administrators, Johnson said he wanted men who are smart enough so that industry and labor cannot "trade their pants off of them."

Freight Surcharge Ends Sept. 30; Saving Is Heavy

Expiration Sept. 30 of the period for which the surtax or railroad emergency charge applies promises some relief to shippers, in view of the refusal of the interstate commerce commission to extend the term of this added charge. This charge has been 12 cents per net ton on pig iron in carlots and 2 cents per 100 pounds for smaller shipments. On plates, shapes, bars, sheets, wire and tin plate it has been 2 cents per 100 pounds for all shipments. These rates have applied to interstate and intrastate shipments, regardless of distance.

Chicago Scrap Men Pay Code Wage on 40 Hours

Scrap iron yards in Chicago and vicinity have been put on a 40-hour week and a minimum wage scale of 37½ cents per hour as the result of action by the Chicago chapter of the Institute of Scrap Iron and Steel Inc., voluntarily putting into effect the labor provisions of the code recently adopted by the institute for presentation to NRA for approval.



Operations Yield to Pressure; Steel Rate Recedes to 51%

THE average of steelworks operations in the week ending Aug. 19 dropped from 54 to 51 per cent of capacity. Losses were reported in six of the 10 principal districts.

The rate dropped 6 points in Chicago, 2 in Pittsburgh and eastern Pennsylvania, 4 in Youngstown, 5 in Buffalo and 2 in Cleveland. Operations in the other districts remained unchanged.

A further recession of several points is indicated for the week ending Aug. 26.

Pittsburgh

Steel ingot production at 46 per cent of capacity last week, represented a decline of two points from the week previous. For this week another two-point decline is likely to bring the rate down to 44 per cent.

A leading producer here curtailed open-hearth schedules to 45 per cent last week and will go lower this week. A leading independent mill still is operating at 51 per cent but orders dropping off generally forecast some easing in operations.

Blast furnace operations hold steady at 46 per cent, with 23 stacks blowing out of 53. Of these 15 are being operated by three subsidiaries of the United States Steel Corp., six by the Jones & Laughlin Steel Corp. and one each by Pittsburgh Crucible Steel Co. and Pittsburgh Steel Co. Of the 15 Corporation stacks Carnegie is operating 13, American Steel & Wire one and National Tube one.

Chicago

Ingot production declined 6 points the past week to 48 per cent, largely through reduced schedules at two mills. Blast furnace operations also were reduced, as a result of the banking of two stacks, to 11 active units of the district's 36 steelworks furnaces. The outlook for future operations is uncertain, with smaller decreases anticipated over the next several weeks.

Youngstown, O.

Steel production here dropped four points last week, to 60 per cent of capacity. A further decline of two to three per cent is indicated for this week. Fifty of 83 open hearths were melting at the start of this week.

Cleveland

Steel ingot production for the week ended Aug. 19 averaged 77 per cent, down two points from the week preceding. National Tube Co., Lorain, continued with all its 12 open hearths in operation, and Otis Steel Co. with 6, but Corrigan, McKinney Steel Co. took off one, operating 12. Though no change is scheduled this week, the slower rate of finishing mill operations as unfilled tonnage diminishes indicates further easing in open hearth production soon.

Buffalo

Buffalo district steelworks production dropped five points last week to 53 per cent of capacity and was expected to remain at that point during the present week, with 20 open hearths in production. Next week may drop to 40 per cent.

Eastern Pennsylvania

Steelmaking operations on the central eastern seaboard have dropped two points and now are at 40 to 41 per cent of capacity. A further slight recession is expected this week.

Detroit

Production of steel in this district is unchanged at 55 per cent with no indications of altered conditions this week. Decrease in steel orders indicates a lower rate is approaching.

Wheeling, W. Va.

At 80 per cent of capacity, steel production in this district is holding

(*Please turn to Page* 18)

Operating Rate of the Steel Industry, by Weeks

All figures except monthly open-hearth and bessemer totals of American Iron and Steel institute are percentages, based on reports from Pittsburgh, Chicago, Youngstown, eastern Pennsylvania, Cleveland, Birmingham, Buffalo, Wheeling, New England, St. Louis, Lorain, Detroit districts. Weeks end Saturday. STEEL's weekly estimates take into account only actual available capacity, which is less than Institute's total.

1932	1st Week	2nd Week	3rd Week	4th Week	5th Week	STEEL's Average	Institute's Monthly Total tons	Institute's Monthly Average
Jan.....	22	25	26	27	28.5	25.7	1,484,991	26.41
Feb.....	28.5	27	25	25	....	26.4	1,481,253	27.40
March....	25	25.5	24.5	23	....	24.5	1,433,337	24.55
April.....	23	22	22	23	24	22.8	1,259,629	22.40
May.....	24	24	25.5	23	....	24.1	1,125,243	20.01
June.....	21	17	17	17	....	18.0	912,757	16.23
July.....	14.5	12	15.5	16.5	16.5	15.0	806,722	14.92
Aug.....	14.5	14.5	15.5	14.5	....	14.7	846,730	14.50
Sept.....	13.5	15.5	15	17	....	15.3	991,858	17.64
Oct.....	18	19	19.5	19.5	19.5	19.1	1,087,058	19.33
Nov.....	21	21	19	17.5	....	19.6	1,032,221	18.36
Dec.....	16	15	14	12	13	14.0	861,034	15.31
1933								
Jan.....	15.5	17	18	19	....	17.4	1,030,075	18.23
Feb.....	19	19	19	17	....	18.5	1,086,867	20.83
March....	15	13.5	15	14	15.5	14.6	909,886	15.50
April.....	17.5	20.5	25	29	....	23.0	1,362,856	25.08
May.....	33	36	40	43	....	38.0	2,001,991	34.11
June.....	47	48	49	51	54	49.8	2,597,517	45.96
July.....	55	57	57	55	....	55.8	3,203,810	58.95
August....	54	54	51	..	....	....	.....	.....

Nonstandardized House Holds Greatest Future for Steel

FUTURE development of steel in the small residence field will be found in houses of individual nonstandardized design, as distinguished from the mass production house, and the industry will look to architects, builders and local fabricating shops as the natural and most promising avenue of exploitation.

This conclusion is the outcome of a survey made by a trade research committee drawn from subsidiary companies of the United States Steel Corp. for the purpose of investigating the demand for steel in residence construction. Results of the survey are summarized in a comprehensive 56-page booklet, "Steel Framing for Small Residences," now ready for distribution.

Advocates Variety of Sections

Some investigators have assumed that the future of steel in residence lies in the so-called prefabricated or mass production house. Others have asserted that the solution is to be found in the utilization of standardized parts. The survey indicates that the policy followed by steelmakers 40 years ago in the field of tier buildings is revived with suitable modifications to meet particular needs of the small residence. The policy then consisted in making available a suitable variety of rolled steel sections, with simple rules and tables to facilitate their use, and encourage a large number of architects and engineers to make such application of them as the individual character of each structure dictated.

While application of this policy to residences is not as sensational as some that have been offered, it has the merit of making available for immediate use by a large number of people the results of an intensive study of the present problem based on experience accumulated over many years in other fields. Simplicity and previous success of the method appear to be in its favor.

Nearly 100 different systems of construction were studied, and a number of the residences built in accordance with these systems were inspected by representatives of the committee. The following conclusions were indicated:

1. Wide spread interest in steel framed residences exists. Principal demand is for small 1 and 2-family houses of individual design.

2. Steel can be used advantageously in construction of residences of any architectural style or arrangement to provide a frame that will not shrink, is inherently noncombustible, sanitary and rigid, resists the destructive attack of insects, and can be made permanent readily.

3. Certain new practices can be employed with safety and economy in design of steel framework for small residences along lines not contemplated in current engineering handbooks.

4. With aid of suitable information, steel framework can be designed by architects as readily as in the case of older forms of construction.

5. Details of the steelwork can be developed to advantage in co-operation with personnel of a fabricating shop located in the vicinity of each job.

6. Fabrication and erection requirements are simple and are well suited to equipment of smaller structural or sheet metal shops.

The booklet specifically aims to provide architects, builders and fabricators with convenient information on safe, practical and economic use of steel. New practices are explained and subjected to rule, and the manner in which they can be applied is exemplified. By means of detailed steps, drawings and illustrations, one section shows how arrangement and sizes of all steel members needed in framing a typical house may be determined easily.

Framing Systems Pictured

Also illustrated are a number of framing systems composed of either standard structural shapes or of sheet metal, and presented for the first time is a table which should be helpful in design and computation of thin sheet metal sections. Construction used in the residences doubtless will suggest to the architect and builder many other variations in construction methods.

To simplify the design of steel framing for residences, rules for proportioning individual members are given, and especially arranged tables of safe loads make their selection an easy matter. Differences between conditions which govern use of steel in tier buildings and residences is emphasized.

A selected group of steel products suitable for residence framing is listed for ready reference, containing the following: Structural shapes, including two new light-weight beam sections; plates, both sheared and universal; pipe for column purposes; hot rolled strip; and annealed sheets.

Copies of the booklet, which is attractively bound in 8½ x 11-inch size, may be obtained from sales offices of subsidiary companies of the United States Steel Corp.

Financial News of Steel Industry

McKEESPORT TIN PLATE CO. reports a net profit of $716,083, equal to $2.39 a common share, for the half ending June 30, 1933, as compared with $668,151, or $2.23 per share, in the first half of 1932.

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Crucible Steel Co. of America reported for the first half of 1933 a net loss of $1,024,772, compared with a net loss of $1,681,581 for the first six months of 1932.

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A refund for overassessment of income taxes for the year 1924 amounting to $74,884.13 has been granted to the American Rolling Mill Co., Middleton, O., by the bureau of internal revenue.

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Vanadium-Alloys Steel Co. for year ending June 30 reports a net loss of $147,494, after interest, depreciation, etc., compared with a net loss of $326,745 in the preceding fiscal year.

□ □ □

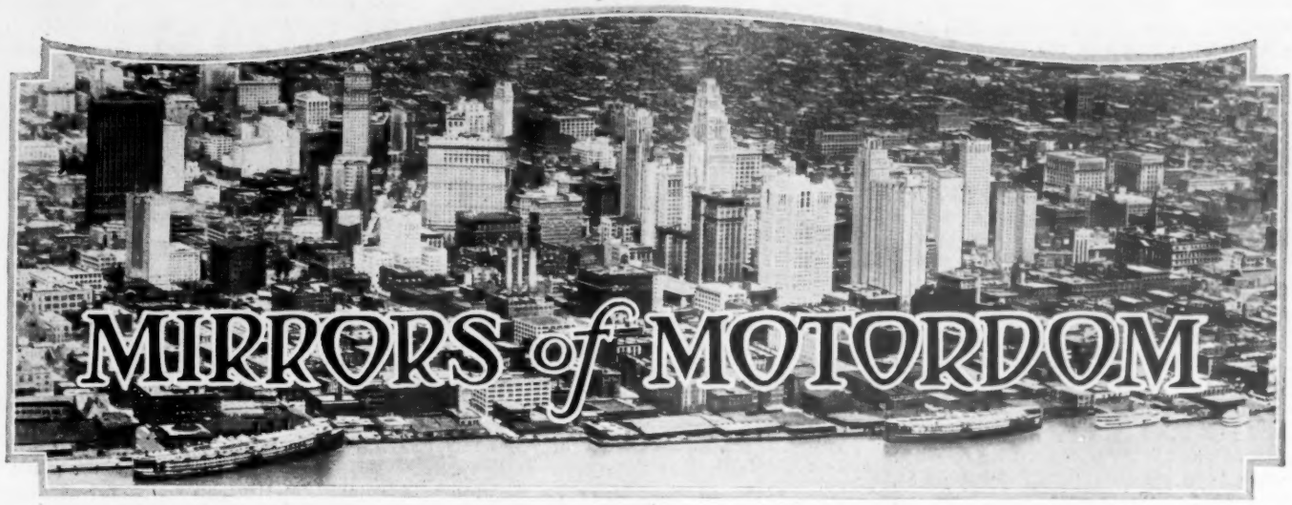
National Steel Car Corp. Ltd., Montreal, had a loss from operations of $290,686 for the fiscal year ended Dec. 30, 1932, according to its annual financial statement just made public. This loss compares with an operating profit of $59,482 for the previous year.

□ □ □

Superior Steel Corp. in the quarter ending June 30 had a net loss of $74,770, after taxes and charges, compared with a loss of $172,338 in the preceding quarter and $125,128 in second quarter of 1932. First half net loss was $247,108 against $275,772 last year.

□ □ □

Eastern Rolling Mill Co., Baltimore, reports a net loss for the second quarter of 1933 of $63,611 compared with $65,888 for the first quarter and $132,136 for the second quarter of 1932. According to the statement of A. J. Hazlett, president, "production has not been resumed but conditions in the industry have been improving and plans are being laid to start again as soon as the improvement is sufficient to justify that action."



Fall Trend Is Anyone's Guess

• • •

Follow Precepts of Auto Code

• • •

Talk New Wheel Suspension

DETROIT

THE industry hasn't struck its 1933 colors yet. Production may be on the wane and past its 1933 peak, but it is surprising the way the aggregate output of all makers remains up. Since the production flag was run up in July to its high point for 1933, output has held remarkably well.

Here and there are noted assembly curtailments that promise to be accentuated in the ensuing weeks. Chevrolet is running through this month at a reduced rate. Other General Motors units follow this course. Many of the independents, such as Hupp, Hudson, Packard and others, are feeling the effect of partial August vacations.

Chrysler, however, is stepping up. Late last week Plymouth released 6500 additional jobs supplementary to a previously announced 30,000 for Aust. Dodge advanced slightly last week. Ford is steady with the production of close to 2500 units daily. Ford, in fact, appears to be the only major producer who at this time has determined on a September schedule.

The picture must not be considered as too bright, however. It hardly seems credible that the automobile industry could overcome the usual dip in mid-summer.

Nineteen thirty-three in retrospect will go down as an unusual year. Each of its seasons, as far as automobiles are concerned, was late. There was no early spring buying. Instead July was the busiest month. Theoretically, August of this year corresponds to a May or June of other times.

What is ahead for the fall months? Perhaps the industry may back and fill and ride into the change-over period for 1934 models with scarcely a ripple in schedules. Detroit admits there is no clear course ahead. Too much is at stake in Washington potentialities.

The activity of the past three months has been so astounding that perhaps we are blending the fall outlook with miracles. But no less an authority than Alfred P. Sloan Jr.,of General Motors, guarded himself last week in his Fall prognostication to stockholders by saying:

Naturally the question arises as to whether such a substantial and rapidly accelerated improvement will or will not be sustained—whether it is based upon a solid foundation of normal industrial recovery or whether it is too greatly influenced by special circumstances of an abnormal character. To separate one set of influences from the other and to weigh each individually, or in other words, to answer the question, would be purely an expression of individual opinion. In my judgment, it should only be answered by the events themselves as they develop through the course of time.

Already, more automobiles have been produced and sold in seven months this year than in all 1932. Though the breakdown by months is purely a guess, August to December may mean the bettering by a margin of 700,000 cars the record of all 1932.

AS IF it were already law, motordom is observing many features of its unsettled code. General Motors has recently swung into observance of a 37½-hour week, comprised of five 7½-hour days. Chevrolet, its largest unit, is now employing 47,000 and because of the change in shifts and shortening of hours has hired 11,000 additional since June 10. Ford, though still outside the fold, is observing the five-day 40-hour week.

Various reasons have been speculated upon for the failure of Ford to cooperate with the drafting of the automobile code. As the largest maker ostensibly not interested in the preliminary negotiations, Ford has caused observers to advance many explanations for this attitude. One is that the code provisions will mean a serious cut in pay for most of the Ford workers.

To relay common expression in Detroit, the code also may obligate Ford to strike an attitude on material buying that may be innovating. Belief runs to the effect that it is but a question of time, nonetheless, before the Ford organization is operating under the code. Detroit is not taking too seriously the "lone-wolf" attitude.

The Ford company in the past week or more was host at Dearborn to many hundreds of organization men, brought in to headquarters from domestic points and foreign lands. Chevrolet, in large meetings at Detroit last week, likewise groomed key field men for the final 1933 sales thrust. Both prepared their executive organizations, in addition, with fairly well defined plans of early 1934 objectives.

In the objective for the rest of 1933 is the desire to enter the new year with small dealers carry-overs. Unlike previous years, higher manufacturing costs which are forecast will dictate no year-end price sacrifices.

FOR Chevrolet, Ford—and for that matter most all of the makers—steel and other materials have been almost inclusively contracted for on present models. Only sample lots of the new sizes of sheets, and the like, that are to be required for the coming year's cars have been specified and taken out. Tool and die programs have been extremely slow in release. Chevrolet and Buick both held up certain die details last week.

Of the new cars that will be out first Buick's probably will be the earliest before the public. Not radically changed in body style, there is a report though that an innovation will be made in Buick wheel suspension.

This will necessitate a change in the spring system, and coiled springs seem a certainty. If already-known details on the means of independent wheel suspension bear ultimate confirmation over-sized tires may be adopted as

standard. This wheel suspension is similar to that experimented with and planned a while ago for Cadillac.

Hudson has a fairly large program about ready to release. A feature is the anticipated body and frame refinements of the Terraplane, but its power plant likely will be unchanged. Hupp has a small series with short wheelbase in mind. The Dodge engineering division of Chrysler is working on extensive changes, but it will be the Chrysler lines wherein the greatest changes will be noted next year.

Budd has taken the Studebaker body work for the coming season and Hupp is changing a body supply source. Continental Motor officials meeting recently decided to withdraw body work from Hayes Body at Grand Rapids and place it in Continental's Detroit plant. The three Continental lines will be changed soon.

DETROIT'S newest and most novel steel mill, Rotary Electric Steel Co. (Michigan), began to pour some steel ten days ago. Construction of this mill was commenced last winter and tests had been going on in Ohio for some time previously.

The mill probably will confine itself to cold-finished steel bar production for the time being at least, although all grades of electric furnace steel, including certain corrosion-resistant grades, can be made.

Part of the economy of the process when tests were being run was predicated upon a 100 per cent scrap burden. Like other electric furnaces a low phos scrap was to be used. Since, however, this mill has decided upon the use of any of the open-hearth grades of scrap, providing the carbon and phosphorus content are not too high. Machine shop turnings and other open-hearth grades of scrap have been purchased recently for test.

Great Lakes Steel Corp., division of National Steel Corp., continues to run all six of its available open hearths. Work on driving of the piles for the two additional open hearths Great Lakes will build has not yet been completed.

RECEIVERS for Studebaker will sell the Pierce-Arrow division to a private enterprise if present plans go through. Pierce was swept into the Studebaker receivership, being a subsidiary. It may now emerge independent as it was before the merger. . . . Chrysler is about to build a new eight-story office building at the Jefferson avenue plant, Detroit. It will fulfill a long-time need when it houses all of Chrysler Corp. executives under one roof. . . . General Motors' cash increased from $172,780,695 to $200,488,763 in the first six months of this year. Working capital showed a corresponding increase. . . . Murray Corp. is working off an unfilled order backlog of around 170,000 beer barrels. . . . Graham Paige has increased its August production schedule 26 per cent over the number originally planned.

Died:

WYLLYS EDMUND DOWD JR., 54, vice president, Foster-Wheeler Corp., New York, at his home in Greenwich, Conn., Aug. 14. Born in New York, Mr. Dowd was graduated from Sheffield Scientific school, Yale university, in 1900, with the degree of bachelor of philosophy in mechanical engineering, and immediately thereafter joined the staff of the chief engineer of the Manhattan Elevated railway, New York. A year later he became mechanical engineer for the East Jersey Pipe Co., Paterson, N. J.

In 1903, he became affiliated with the engineering staff of the Crane Co., working in Chicago and Bridgeport, Conn., and two years later became associated with the Power Specialty Co. of New York, as Philadelphia manager. At the time of his death he was secretary, treasurer and a director of this company. He was associated with the Foster-Wheeler Corp. for 27 years.

Mr. Dowd was president of the Yale Engineering association, and was a member of the American Society of Mechanical Engineers, the Society of Naval Architects and Marine Engineers, the Union club and numerous other organizations.

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Herman S. Scheidemantle, 51, superintendent of the forge shop, Erie Forge & Steel Co., Erie, Pa., in that city, Aug. 1.

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Enoch T. Holt, 72, for 30 years superintendent of the Brightman Nut & Bolt Mfg. Co.'s plant in Sandusky, O., in that city, Aug. 2.

□ □ □

William Henry Grubb, 58, controller of the International Nickel Co. of Canada Ltd., at his home in Passaic, N. J., Aug. 14.

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Howard R. Formhals, assistant traffic manager for the Pittsburgh Screw & Bolt Corp., Pittsburgh, since 1918, at Pittsburgh, Aug. 10.

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John H. Waters, 74, president, National Radiator Corp. and of the United States National bank, Johnstown, Pa., in Washington, Aug. 7.

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Henry Norman Corley, 47, vice president, Corley-DeWolf Co., Elizabeth, N. J., manufacturer of railway equipment, at his home in Elizabeth, Aug. 15.

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Otis A. Brown, 88, retired official of the Knoxville Iron Works, Aug. 5, at Knoxville, Tenn. He had been connected with Knoxville Iron Works for 50 years at the time of his retirement 12 years ago.

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William H. Jenkins, 66, retired, at Ocean Park, Wash., Aug. 5. He had been actively identified with the metal trades for years, being one of the owners of the Commercial Boiler Works, operating a large plant at Seattle.

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Adolph N. Miller, 70, president A. N. Miller Co., Milwaukee, manufacturing special machinery and tools, in Milwaukee, July 30. He was born in Washington county, Wis., and went to Milwaukee in 1890, shortly afterward becoming connected with the National Brake & Electric Co.

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Roy L. Sanford, 57, vice president of A. M. Castle & Co., distributors of iron and steel products, Chicago, Aug. 13, at San Francisco, where he represented the company. Mr. Sanford was born in Peoria, Ill., and had been associated with A. M. Castle & Co. for nearly 30 years. Prior to 1906 he was located in the Chicago sales office, going to San Francisco as representative in that year. Later he became vice president and when the Berger-Carter Co., San Francisco, was acquired by A. M. Castle & Co. a few years ago, he took charge of the warehouse there.

Operations Drop to 51%

(*Concluded from Page* 15)

steady and unchanged. Out of 37 open hearths 27 are operating. Some of the latter are of larger size than those inactive.

New England

New England's steel production rate this week will be ten points higher than the 83 per cent of capacity maintained last week. This is the highest rate since recovery began. Two works expect to touch 100 per cent. One 50-ton furnace will be put in to replenish depleted inventory.

Birmingham, Ala.

Thirteen open-hearth furnaces are still producing, eight at Fairfield, Tennessee Coal, Iron & Railroad Co., and five Gadsden, Gulf States Steel Co., 55 per cent of capacity being maintained.

Employs Its Largest Force

Pressed Steel Tank Co., Milwaukee, has increased its working force to 1000 men since it began fabricating steel beer barrels, the largest in its history. Nearly 400 men were added in July when production facilities were practically doubled.

Industrial Men in the Day's News

R. B. Wilson, Manager, St. Louis Plant, Joseph T. Ryerson & Son Inc.

PRACTICAL experience in making steel has aided him appreciably in selling it.

HE knows processes and products, and how they may be best adapted to the needs of industry.

TWENTY years he has been associated with the warehouse firm for which he is now St. Louis manager.

FROM making steel to selling it—and selling it so well that he has been appointed manager of the St. Louis plant of Joseph T. Ryerson & Son Inc., Chicago—is the experience of Richard B. Wilson.

Friends speak of "Dick" Wilson as a typical "self-made" man, who has advanced from the mills, where he learned how to make steel, through various positions in which his practical knowledge proved beneficial.

He has been in the steel business all his life; understands processes and products, and has an enviable reputation for holding his "trade."

Mr. Wilson first became associated with the Ryerson organization at its Chicago headquarters more than 20 years ago. He was a member of the shipping and sales department staff for some years, and then was transferred to St. Louis in charge of the city sales department. Subsequently he was appointed sales manager and assistant to H. B. Ressler, who was then manager of the St. Louis plant and now is vice president in charge of sales of the Ryerson company. The St. Louis district, in which Mr. Wilson now is manager, is considered one of the most important divisions in the Ryerson national steel warehouse service.

Mr. Wilson enjoys outdoor recreations, and is a member of the Algonquin Golf club and the Missouri Athletic association, St. Louis.

GEORGE E. JOHNSON, long associated with Fairbanks, Morse & Co. in executive capacities, has resigned to join the A. O. Smith Corp., Milwaukee, as assistant to W. C. Heath, vice president and general manufacturing manager. Mr. Johnson formerly was manager of the Fairbanks, Morse & Co. works at Three Rivers, Mich.

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H. W. Thorne has been elected president and treasurer of the Holland Furnace Co., Holland, Mich., succeeding C. H. Landwehr. Other officers elected include: Vice president in charge of production, P. T. Cheff; vice president in charge of sales, P. W. Burns; secretary, William Tahaney; and assistant secretary and treasurer, G. B. Tinholt.

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J. H. Schroeder has been appointed assistant traffic manager of the Tennessee Coal, Iron & Railroad Co., filling the vacancy caused by the death of C. T. Mayfield on July 2. Mr. Schroeder was previously chief clerk in the traffic department of the eastern district of the United States Steel Corp. at Pittsburgh.

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W. E. Herb has been appointed New York district sales manager for the Gifford-Wood Co., Hudson, N. Y. He is successor to George V. Christie.

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William H. Moore recently has been appointed Chicago district manager of the Peninsular Grinding Wheel Co., Detroit. Mr. Moore has been connected with several railroads and also with the Metal & Thermit Corp., and Burnside Steel Foundry Co.

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George W. Gauntlett, construction engineer with associations in the steel industry, has been elected president and general manager of the Pioneer Sand & Gravel Co., Seattle. This company operates a warehouse and plant through which it represents the Columbia Steel Co. in distribution of reinforcing steel.

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I. J. Trahan, for 25 years Pacific coast manager for S. A. Woods Co., manufacturer of woodworking machinery and equipment, has joined W. H. Tierney, electrical engineer ,in organizing the W. H. Tierney Electric Co., Seattle, with Mr. Trahan as president.

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F. W. Altorfer has been appointed New York district sales manager for the National Acme Co., Cleveland, succeeding Willard A. Johnson, transferred to Cleveland.

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J. C. Fox, chief chemist and metallurgist, Doehler Die Casting Co., New York, has removed his head-

(*Please turn to Page* 53)

EDITORIAL

The Public—Shall It Be Friend or Foe of Steel?

SEVERAL incidents which have occurred during the past few weeks raise doubt as to whether or not the leaders of the iron and steel industry have a proper regard for the importance of public opinion. In fact, it looks as if the industry prefers what the British call a "poor press."

During the hearing on steel's code of fair competition, the industry withdrew parts of the code dealing with the open shop principle and employe representation plans. Although this move had been arranged beforehand, it was a complete surprise to the public. Newspaper reporters covering the hearing sensed its news value immediately.

Desiring more than a plain statement that the labor clauses had been eliminated, the newsmen scouted around for interviews. Spokesmen for union labor were willing to talk and to be quoted. Some of them had mimeographed copies of prepared statements, ready to be handed out a short time after the meeting convened. Steel executives were close-mouthed. They had nothing to say to the public.

As a result the majority of afternoon papers on July 31 carried headlines such as "Steel Barons Capitulate To Labor," "Unions Win Great Victory; Steel Gives In," etc. Only a few of the more careful afternoon papers reported the situation correctly. The morning papers of the following day were somewhat more accurate in their reports.

Steel Industry Held Up To Nation as Having Maliciously Defied the Government

Again last Tuesday, when a number of steel company presidents left a conference when William Green appeared, many of the newspapers gave their readers an erroneous impression of the incident. Mr. Green talked freely to the representatives of the press. Steel executives, although temporarily in a position in which it would have been unethical to issue a statement, delayed doing so until long after it would have been proper for them to speak. Not one word of explanation of the steelmen's action was issued until Wednesday afternoon—24 hours after the event—when the president of one company explained why the group had refused to sit with Mr. Green. The result of labor's activity and steel's lack of it was that many newspapers represented the steel industry to their readers in an unfair light. Some broadly hinted that steel had openly affronted the government itself. The industry was placed in an embarrassing position; it was on the defensive.

These and other similar incidents indicate that the great iron and steel industry is amateurish in its handling of public relations. Because of clumsiness in this respect, the public has gained impressions which are decidedly harmful to the interests of steel.

The problem is more important now than at any time in recent years. While Judge Gary was alive, he represented the industry on all important occasions and through his statements the man in the street gained a reasonable conception of the aims and policies of the iron and steel industry. Since his death, steel has not been in the public eye in important degree until recently. Today, when it is highly desirable that the actions of the industry be interpreted faithfully for the information of the public, the voice of steel is inarticulate.

Should Recognize Value of Good Will of Public; Cost Trifling Compared To Potential Savings

Fortunately steel executives have displayed faint indications that they recognize this defect. Some months ago the American Iron and Steel institute employed on a part time basis a competent director of public relations. He is in a position to do excellent work for the industry if his employers will give him sufficient freedom to do what everybody else knows should be done.

However, before steel can hope to win the confidence of the public, the attitude of the top men must be changed. First, they must recognize more fully than in the past that certain affairs of the steel industry are legitimately of interest to the public. Second, they must get over their gun-shy attitude in dealing with the daily press. Third, they must realize that a few thousand dollars spent in promoting proper public relations will save some of the millions which are lost annually through the "soak the steel industry" attitude of federal, state and local politicians, who legislate against steel's interest simply because they know that the man in the street—the man who votes—has no great love for steel.

THE BUSINESS TREND

NRA and Seasonal Factors Still Depress Business

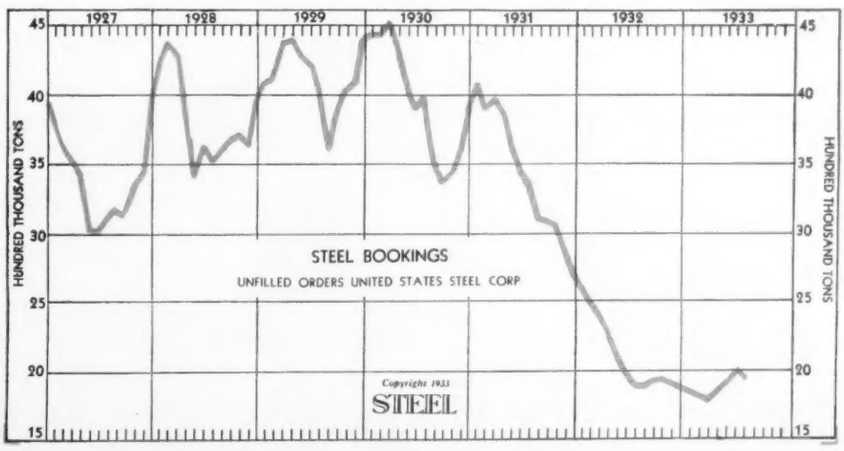
IT IS becoming increasingly difficult to determine how much of the present recession in industrial activity is due to seasonal tendencies and how much of it is traceable to uncertainties caused by NRA.

During the past week the majority of evidence has pointed to NRA as the principal retarding factor. The freezing of inquiry in the heavy industries is more pronounced, and operations in many lines—which had been holding up well by virtue of the carryover of old orders—now are beginning to shrink at a more rapid rate. This is true of steelworks operations. During the first half of August, steelmaking strongly resisted the downward pressure. Last week the resistance weakened perceptibly and a drop of several points in the operating rate was recorded.

Production of electricity in the week ending Aug. 12 was 1,627,339,000 kilowatt hours compared with 1,650,013,000 in the preceding week. The decline corresponds with the usual trend at this period in recent years. Car loadings, which declined slightly in the week ending Aug. 5, may show a further mild decline when the figures for the week ending Aug. 12 are made public. According to preliminary estimates the total will be about 610,000 cars, as compared with 613,112 in the preceding 7-day period. In both power output and car loadings the showing in the western part of the country is better than that of the eastern industrial section, when compared with figures for the previous week and for the corresponding week last year.

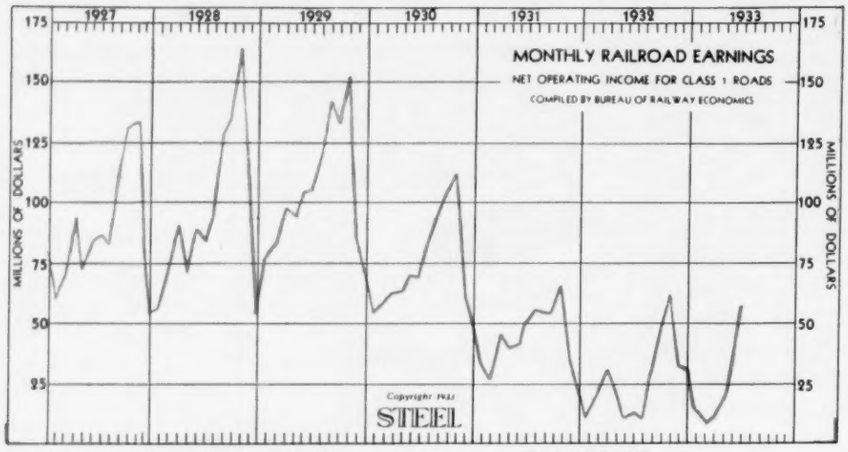
Final Outcome of Steel, Oil, Coal and Auto Codes Will Influence Course of Business

The business trend will be affected directly by the outcome of the four important codes now before NRA—steel, coal, automobile and oil. Important developments are expected soon, and business will breathe a sigh of relief when the uncertainties now prevailing in regard to them are settled.



1933 Million Tons	
July	2,020
June	2,106
May	1,929
April	1,864
March	1,841

1932 Million Tons	
July	1,966
June	2,034
May	2,177
April	2,326
March	2,472



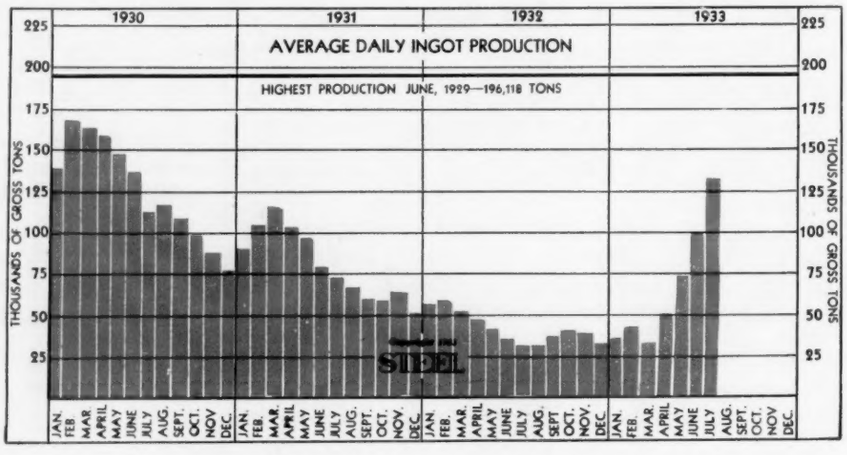
June, 1933	$59,453,185
May, 1933	40,693,072
June, 1932	12,299,666

June Railway Earnings Show Further Improvement

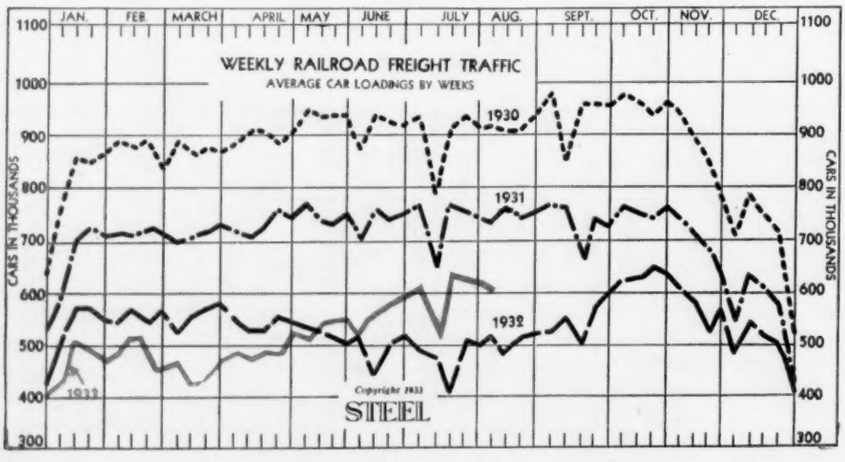
Class 1 railroads of the United States for June had a net operating income of $59,-453,185, which was at the annual rate of return of 2.81 per cent on their property investment. In June, 1932, the net operating income totaled $12,-299,666 or 0.58 per cent. Fifty-two class 1 railroads failed to earn expenses and taxes in the first six months of 1933, of which 11 were in the Eastern, 9 in the Southern and 32 in the Western District.

July Ingot Output Climbs; Highest Since June, 1930

Output of steel ingots in July was at the rate of 128,152 gross tons per day, the highest rate since June, 1930. The July rate was 28.27 per cent heavier than in June and compares with a daily output of 32,269 gross tons during July, 1932. According to statistics of the American Iron and Steel institute, total calculated output for seven months of 1933 is 12,193,002 tons, compared with 8,503,932 tons in the same period of 1932.



July, 1933	128.152
June, 1933	99,904
July, 1932	32,269



	1933	1932
Aug. 5	613,112	496,626
July 29	648,396	511,103
July 22	648,914	501,912

Freight Car Loadings Decline Moderately

Revenue freight car loadings for the week ending Aug. 5 totaled 613,112 cars, according to the report of the American Railway association. This was a decrease of 25,294 cars below the preceding week this year but an increase of 116,486 cars above the corresponding week in 1932. All commodities showed reductions under the preceding week except ore, and merchandise less than carload freight. All commodities showed increases over the corresponding week last year except grain and grain products.

Adjusting Crane Control by Speed-Torque Curves

Part II—Hoist, Trolley and Bridge Connections

BY A. A. MERRILL
General Electric Co.

A hot ingot being handled by soaking pit crane in open-hearth department of Wheeling Steel Corp., Portsmouth works, Portsmouth, O. The crane is driven by four motors aggregating 125 horsepower

IN the accompanying article, the second of three, is discussed the adjustment of series motor resistors and their effect on crane operations. Part I, appearing in the July 31 issue of STEEL, explained speed-torque curves and how they picture crane performance. Part III, to be presented soon, will deal with lowering connections and dynamic braking. The author is associated with the industrial engineering department, General Electric Co., Schenectady, N. Y.

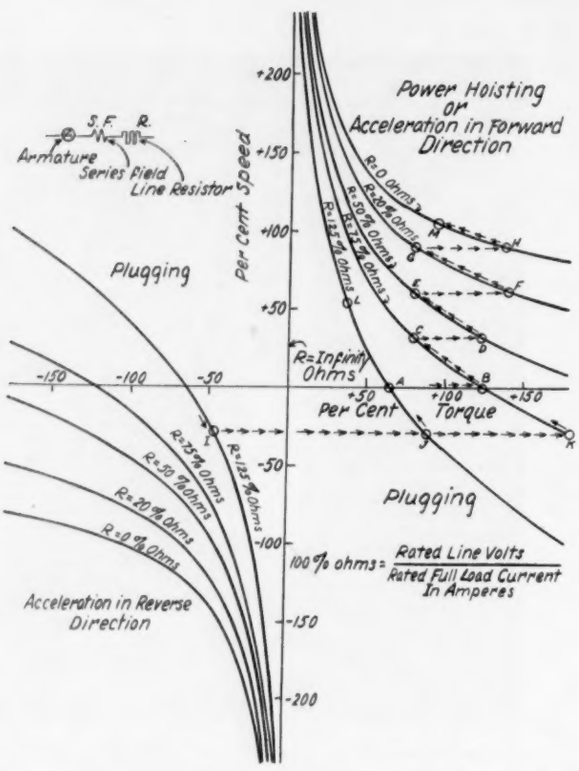
FOUR common types of connections are found in crane-type series motor control, namely: Straight series connection with series line resistor; shunted motor; shunted armature; and armature circuit paralleled by field circuit. The first three of these connections usually are used on the hoist motion of a crane, or for the operation of a crane bridge or trolley, and will be discussed in this article. The last connection has excellent dynamic braking characteristics, and is usually used on the lowering motion. This connection will be analyzed in the concluding article of this series.

The four-quadrant speed-torque chart will be found a most useful tool for the analysis and adjustment of series motor control, for effects of a change of connections or of resistor values on the operation of a crane may be observed at a glance.

We shall consider first the straight series connection with series line resistor. Fig. 4 illustrates a few of the speed-torque curves obtainable from this common connection. Each curve is marked with the amount of line resistance included in the circuit, expressed in "per cent ohms." "One hundred per cent ohms" is defined as the "rated line voltage" divided by the "rated line current."

As explained in the preceding article, speed is plotted vertically, being expressed in "per cent of rated full-load speed," and torque is plotted horizontally in "per cent of rated full-load motor torque." There are two sets of curves, one mirroring the other. If the motor is connected for rotation in the forward or hoisting direction, the right-hand set is obtained, while if the connections to either the armature or to the series field are reversed, the left-hand series is the result.

This connection is used ordinarily for acceleration of a crane load in the hoisting direction, or for acceleration or deceleration by plugging of a crane bridge or trolley. The connection is not used for lowering an overhauling load, for dangerous speeds would be obtained. This is shown by the left-hand series of curves. The motor will start the load down very well, but exerts no braking torque, and a light load or an



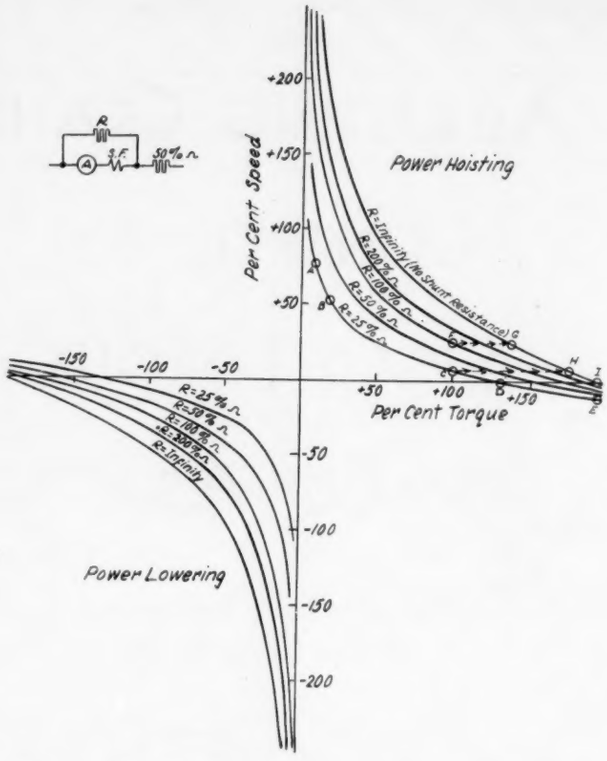


Fig. 4 (Left)—Speed-torque curves for a series motor using a series line resistor. Fig. 5 (Right)—Speed-torque curves for a series motor using a variable shunt across the terminals.

overhauling load would result in runaway speeds. If a mechanical brake is used, however, speeds could be limited, and this connection would be applicable. A crane bridge or trolley provides positive loads in both directions, so that both sets of curves are practical for this application.

If the line resistance is zero, the fundamental series motor characteristic is obtained (curve marked $R = 0$ ohms). By definition 100 per cent torque corresponds to 100 per cent speed. High speeds are found at light loads, approaching runaway speeds at "no load." The friction encountered in a crane drive is sufficient to limit speeds to safe values, however, except with an overhauling load. If a positive load is applied, the motor slows down with strengthening field to deliver high torque. Both of these characteristics are valuable in a crane, for light loads are hoisted rapidly, wasting little time, while heavy loads are carried at a low speed, requiring a low power demand from the line.

Characteristics Change

As the series resistance is increased, in this case to 20, 50, 75, or 125 per cent ohms, the following changes may be noted:

1. Speed regulation, or change of speed with load, is made rather poor. This is brought about by the increasing steepness of the curves, as for example, the steepness of curve section *L-A* when compared with *M-H*. For this reason, this connection makes a rather poor slow speed or "creeping speed" point. The principal value of this connection lies in the acceleration or deceleration of a load, for current and torque peaks are reduced.

2. Starting torque is reduced, as from point *B* to point *A*.

3. The torque peak obtained by notching the drum switch to the next point is increased. To illustrate this effect, a typical cycle of acceleration is sketched on the chart. Each curve is supposed to represent the conditions existing on one point of the drum switch. In notching from the first to the last point, with a load of 80 per cent torque, the speed and torque values follow the arrows through points *B*, *C*, *D*, *E*, *F*, *G* and *H*. In actual practice, the resistors should be so adjusted that the torque peaks are uniform.

In this example, peaks *H* and *F* amount to about 140 per cent torque, while *D* and *B* are lower, at about 125 per cent torque. If the curve marked "50 per cent ohms" is raised, by decreasing the resistance to about 45 per cent ohms, torque peak *F* will be reduced, and *D* will be increased, making a more uniform set of torque peaks. The curve marked "75 per cent ohms" might then be raised slightly, by the same means which would result in an increase of the starting torque at point *B*, and a reduction in peak *D*.

Such a change in resistor sections must be watched carefully. In the first place, the current carrying capacity of the grids added to a section must be sufficient to prevent overheating. Second, a change in the resistor tap may affect other positions of the drum switch, so that connections should be checked and the effect of the change on the operation of the other position studied.

4. Plugging torque is decreased. For example, in plugging from 30 per cent speed, at point *I*, a plugging resistor of 125 per cent ohms will provide 90 per cent plugging torque, point *J*, while a resistor having 75 per cent ohms would give 180 per cent plugging torque, point *K*. Both of these curves would give excessive torque when plugging from full speed, and the series resistance should be increased, if this type of operation is desired.

Shunt Effect Considered

We shall now consider shunted motor connections. Fig. 5 illustrates the effect of the addition of a shunt resistor across the motor terminals. As illustrated in the connection sketch, a line resistor is included in the circuit, in this case 50 per cent ohms. If the shunt has a resistance of infinity ohms, therefore, the same curve is obtained as that illustrated in Fig. 4 for a 50 per cent line resistance. See the curves marked R = 50 per cent ohms, Fig. 4, and R = infinity ohms, Fig. 5. In the first case, "R" represents the line resistor, in the second case, the shunt resistor.

As the shunt resistance is decreased,

the curves are dropped toward lower speeds, and the following changes may be noted:

1. Speed regulation, or change in speed with load, is improved at the high torque part of the curves, as may be noted by the flatness of curve section *C-D*, as compared with *G-I*. For this reason, this connection frequently is used as a slow speed or "creeping speed" point. Speed regulation is poor, however, at light loads. This is seen by the steep slope of the curve section *A-B*.

2. Starting torque is slightly decreased, as from *I* to *D*.

3. The torque peak on the next position of the drum controller is increased. For example, the torque peak *C-H* is greater than *F-G*. These peaks assume that the next position of the controller is a series line resistor connection with 50 per cent line resistance. The same effect holds true, however, with other curves of a similar nature.

Plugging Is Impractical

4. Plugging deceleration becomes impractical because of the rapid increases of torque with speed in the plugging part of the curves, as may be seen by the increase in torque from *D* to *E*. Disastrous commutation would result if plugging were attempted from full speed to a shunted motor point.

In the lowering direction, the same impractical conditions of runaway speeds with an overhauling load are encountered. With a crane trolley, however, with a positive load in both directions, the curves are applicable.

This family of curves corresponds to the 50 per cent ohms curve of Fig. 4. Each curve of Fig. 4 will have a similar family of curves, if a shunt is applied across the motor. The characteristics of each family of curves will be similar to those discussed above for a 50 per cent line resistor.

Shunted armature connections will be considered next. Fig. 6 illustrates a few speed-torque curves obtainable from the shunted armature connection. One curve, that for a shunt of infinity ohms, is the same as the basic curve shown on Fig. 5 and the 50 per cent ohms curve of Fig. 4.

As the shunt resistance is decreased from infinity ohms, the curves are dropped toward lower speeds, and the following changes are noted:

1. Speed regulation is improved throughout the entire positive range of torque. This may be noted by the flatness of *M-O* as compared with *A-B*. For this reason, the shunted armature connection provides an excellent creeping speed point.

2. Starting torque is slightly decreased, as from *D* to *O*.

3. The torque peak on the next position of the drum switch is increased, as indicated with the shunted motor connection. In Fig. 6 this is shown by the increase in torque peak *N-C* as compared with *H-B*.

4. Plugging deceleration becomes impractical, as was noted with the shunted motor connection. This is indicated by the rapid increase of torque with speed in the plugging quadrant, as with curve section *O-P*.

5. The curves are bulged into the dynamic braking quadrant. The motor now has a definite speed at zero torque.

This characteristic of the shunted armature connection is explained by reference to the connection sketch shown in Fig. 6 As motor speed rises, say from *L* to *K*, the counter e.m.f. generated by the armature also rises. This has the effect of decreasing the armature current, until at point *K* the counter e.m.f. of the armature balances the voltage drop across the shunt resistor, and no armature current flows. If motor speed is increased above this point, by an overhauling load, the counter e.m.f. continues to rise, driving a current in the reverse direction through the armature.

Current Effects Traced

This current passes through the loop circuit made up of the armature and its shunt resistor. The field current, in the meantime, has been decreasing, but still remains in the same direction, also passing through the shunt resistor. With a reversed armature current, and with a field current in the same direction, the motor torque reverses, and dynamic braking is started. The braking torque tends to reach a peak, however, as at point *I*, because of the weakening motor field.

This type of operation is impossible with the shunted motor connection, Fig. 5, for the same current passes through both the armature and the

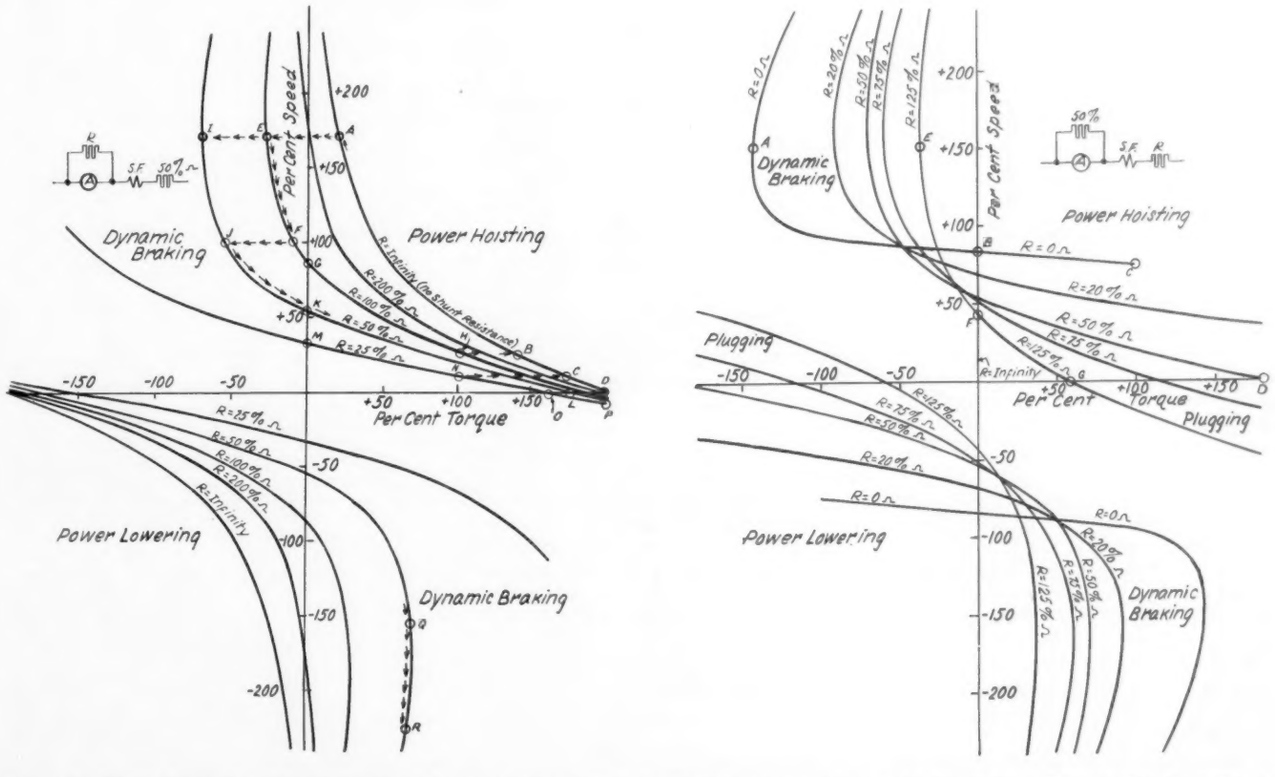


Fig. 6 (Left)—Speed-torque curves for a series motor using a variable shunt across the armature. Fig. 7 (Right)—Speed-torque curves for a series motor using a fixed armature shunt and a variable line resistor

field. The only way to reverse the current in one without reversing it in both is by a change of connections.

This dynamic braking torque becomes valuable when this connection is used as a creeping speed point, for "slow-down" torque is produced. For example, if the motor were operating at 170 per cent speed at point *A*, with a 50 per cent line resistor in the circuit, and a shunt resistor of 100 per cent ohms were applied across the armature, a breaking torque of 30 per cent would be produced at point *E*, which would slow the motor down rapidly to the desired low speed. This braking or slow-down torque is increased by a decrease in shunt resistance, as from *E* to *I*.

This torque may become excessive, causing poor commutation, if the shunt resistance is too low. For this reason, two shunted armature points are frequently used. The second point would have the highest shunt resistance, and would provide a reasonable amount of slow-down torque from full speed. The first point would be used after the motor had decreased its speed to some extent, and would provide an increase in slow-down torque and a low creeping speed. Such a slow-down cycle may be followed on Fig. 6 by the arrows passing through points *A*, *E*, *F*, *J* and *K*.

Should Avoid Torque Peak

If this connection is used for the lowering of an overhauling load, it becomes rather dangerous, because of the torque peak. If the load on the hook exceeded this torque peak, as at point *Q*, the motor would soon reach dangerous speeds, traveling along the curve toward point *R*. This danger may be remedied to some extent by using a very low shunt resistance, thus assuring a high value of maximum braking torque. The connection to be discussed in the next article of this series is much superior for the purpose of lowering overhauling loads, for the motor field is strengthened rather than weakened by an increase in braking torque.

Fig. 7 also illustrates the shunted armature connection. In this case, however, the shunt resistance is held constant, and the curves represent conditions with different values of series line resistance. One curve of this series, that with a 50 per cent line resistor, is common with Fig. 6, being the same as the 50 per cent ohms curve of the latter chart. Both curves represent operation of the motor with a 50 per cent resistor in each of the line and shunt circuits. By reference to Fig. 7, an increase in the line resistance will be observed to have the following effects:

1. Speed regulation is impaired, as can be noted by the steepness of *F-G* as compared to *B-C*.

2. Starting torque is decreased, as from *D* to *G*.

3. The torque peak on the next position of the drum switch becomes greater, because of the lower speed at any given positive torque value.

4. Slow-down or braking torque is decreased, as from *A* to *E*.

To summarize, the effect of a change of connections or resistor values may be easily noted by means of the four quadrant speed torque curves. In practice, practically all of the series motor connections utilized in the hoisting of a load, or in the driving of a single motor crane bridge or trolley will be found to fall into one of the three groups discussed in this article. Having determined the class of connections, the speed torque chart applying to this particular set of connections may be studied.

The desired change of characteristics, whether it be change of starting torque, speed regulation, or the like, can be interpreted in terms of an increase or decrease of a certain resistor section. Such changes are limited by the current capacity of the grid sections, by the commutating and heating capacity of the motor, and by the effect of the change on the characteristics of other positions of the drum switch. The speed-torque curves, however, provide definite sign posts to guide in the adjustments.

(To Be Concluded)

National Safety Council Sections Announce Programs for Congress

WHAT has the metals industry accomplished during the past year in control of accidents? What are the most important present-day accident hazards? What are individual companies doing to control these hazards; and what can this industry do co-operatively during the coming year in national accident prevention? These are questions to be discussed by members of the Metals section of the National Safety council at the twenty-second annual safety congress in the Stevens hotel, Chicago, Oct. 2-6.

Importance of these problems is indicated by recent reports to the council of the 1932 accident experience of 108 industrial units of the foundry industry with an average of about 20,000 employes. As compared with a like group for the previous year, their accident frequency rates increased 6 per cent, and accident severity 14 per cent.

The accident experience of the 121 industrial units which reported in the steel industry in 1932 was more favorable. They lowered their accident frequency rates slightly, as compared with the previous year; severity rates dropped 21 per cent.

Another important industrial division of the National Safety council, the Power Press section, will hold sessions during the week. In connection with the congress, a permanent exhibit of modern equipment for the promotion of safety and health in industry will be held.

Following are the programs which have been arranged for the Metals and Power Press sections:

METALS SECTION

Monday, Oct. 2

AFTERNOON

"Resume of Year's Activities," by General Chairman Robert L. Schmitt, Louisville Car Wheel & Railway Supply Co., Louisville, Ky.

"The New Deal in Safety," by J. Russell Craig, safety director, Pennsylvania Indemnity Corp., Philadelphia.

"Correlating Safety with Plant Operations in a Steel Mill," by F. M. Gilles, assistant general superintendent, Indiana Harbor mill, Inland Steel Co., Indiana Harbor, Ind.

"Using Our Statistics to Advantage," by W. D. Speight, safety director, Keystone Steel & Wire Co., Peoria, Ill.

Wednesday, Oct. 4

MORNING

Election of officers.

"Safety in the Carbuilding Industry," speaker to be announced.

"Safe Operation and Maintenance of Unfired Pressure Vessels," by E. R. Fish, chief engineer, boiler division, Hartford Steam Boiler Insurance Co., Hartford, Conn.

"Health Hazards in Foundries and Their Elimination," by Dr. Carey P. McCord, medical director, Industrial Health Conservancy Laboratories, Cincinnati.

Thursday, Oct. 5

MORNING

"Data on 1932-33 Safety Contest," by General Chairman Robert L. Schmitt. To be followed by presentation of awards.

"Safety Kinks—Handling Materials by Hand," by John A. Oartel, chief of safety bureau, Carnegie Steel Co., Pittsburgh.

POWER PRESS SECTION

Tuesday, Oct. 3

MORNING

Election of officers.

"Progress During the Past Year," by General Chairman E. J. Smith, Western Electric Co., Chicago.

"Trend of Accidents in the Metal Trades Industry," by A. L. Kaems, safety engineer, Simmons Co., Kenosha, Wis.

"Safe Operation of Portable Pneumatic Tools," by William W. Janzer, safety engineer, Seaman Body Corp., Milwaukee.

"Importance of Inspection in the Press Room," by J. Leonard Juhl, general superintendent of planning, Murray Corp. of America, Detroit.

Thursday, Oct. 5

MORNING

"Selling Safety to Workers in the Metal Trades," by Thomas P. Kearns, superintendent of hygiene and safety, Industrial Commission of Ohio, Columbus, O.

"Elimination of Unsafe Practices," by J. A. Voss, safety director, Republic Steel Corp., Youngstown, O.

Analysis of Factors Influencing

Rolling Pressure and Power Consumption In the Hot Rolling of Steel

BY SVEN EKELUND

Translated* by BENGT BLOMQUIST

Introduction

DURING recent years several attempts have been made to establish a formula by means of which the actual rolling pressure in hot-rolling mills could be calculated. In most cases these formulas have been derived from more or less special premises, so that the formulas would give erroneous results when applied to other kinds of rolling. This is due largely to the fact that consideration has not been given to all of the influencing factors, some of which may be fairly constant within the range of the observed or studied rolling schedule, so that they can be accounted for by an empirically determined constant in the formula. It then is evident that under other circumstances the values of these constants should vary. Therefore, the right way to attack the problem should be to go into a purely theoretical analysis of the dynamics of the rolling process, and eventually to establish a formula in which the meaning and dimensions of the individual factors will be known. Such a formula then could be applied to any rolling schedule, regardless of the size of the mill, with the expectation of obtaining an accurate result.

It is along these lines that Sven Ekelund, associated with the Steel Institute of Stockholm, Sweden, has worked; and he has succeeded in deriving a formula which has proved to be the most reliable yet published.

The rolling process has been subjected to investigations and speculations which have been based upon practical tests or upon theoretical premises. Several works of this kind are found, especially in German literature. Often these investigations have been founded on the extensive research on rolling which was carried out by J. Puppe (*Versuche zur Ermittlung des Kraftbedarfs an Walzwerken, Verlag Stahleisen, Duesseldorf* 1909). The large number of data available in Puppe's publication are well suited for the determination of constants in theoretically-derived formulas which deal with power consumption or with other conditions in rolling. However, in order to be able to arrive at a general formula, it is necessary to know in what manner the deformation takes place during rolling, and also how the internal and external forces are distributed.

Starting with the simplest case of rolling; that is, the rolling of a rectangular section, the first thing to investigate is the manner in which the roll works upon the bar; that is, whether the roll deforms the bar only by pressure or if tension also is present. This, however, is hardly possible to observe in practical tests. The determination of these conditions is rather a theoretical task. With respect to the pure deformation, it has been assumed in some cases that so-called slip-pyramids occur in the material, which themselves should not be deformed, but which were rather to be regarded as tools through which the rolls deform surrounding parts of the bar. Certain external phenomena, the forward slip, for instance, have been explained by the assumption of slip-pyramids; but in the following discussion it will be proven that other explanations for these phenomena also can be given.

*Translated and published in English with the author's permission, from the original article "Nagra dynamiska forhallanden vid valsning," which appeared in *Jernkontorets Annaler* No. 2, 1927.

Part I—Dynamical Conditions in Contact Area Between Rolls and Bar

A. Dynamical conditions in the contact area between rolls and bar. Notation:

h = thickness of bar at any section
b = width of bar at any section
h_1 = average initial thickness of bar
b_1 = average initial width of bar
h_2 = average final thickness of bar
b_2 = average final width of bar
D = roll diameter
R = roll radius
ϕ = angle between vertical center line and radius to the point considered
ϕ_1 = angle of contact
v_2 = circumferential speed of the rolls
$k \cdot v_2$ = velocity of the delivered bar
k = coefficient of forward slip
s = rolled distance, or slippage

The velocity of the roll surface is constant along the entire contact area between roll and bar. However, the velocity of each section of the bar is determined by the delivery speed $k \cdot v_2$, because the same volume of material must pass through each section in unit time. Thus, if an arbitrary point on the roll surface moves the distance $Rd\phi$ during the time dt, the corresponding section of the bar will move the following distance along the roll surface:

$$X = \frac{b_2 h_2 k R d\phi}{b h \cos \phi};$$

and the difference between $Rd\phi$ and X will express the slippage in each section. Thus

$$ds = Rd\phi - \frac{b_2 h_2 k R d\phi}{b h \cos \phi} \quad \text{.....(1).}$$

It should be noticed that this equation is based upon the assumption that the velocity within each section is constant. In reality small deviations will occur, which cause the surface of the bar to have a greater or less velocity than that of the center portions of the cross section.

The "slippage" can be either positive or negative. Positive slippage occurs when the velocity of the roll is greater than that of the bar. The roll then exerts a pull on the bar because of the friction. The reversed conditions apply to negative slippage.

Even without a mathematical analysis, it is evident the positive slippage cannot prevail along the entire contact surface. The necessary reaction against the force tending to pull the bar between the rolls could not arise in this case from the wedge action of the bar. It is also impossible that the bar should have a greater velocity than the rolls along the entire contact surface; that is, that only negative slippage should prevail, because no other forces are introduced except those from the rolls. In fact the case is, that within the system consisting of the rolls and the worked portion of the bar, all forces are in equilibrium, so that

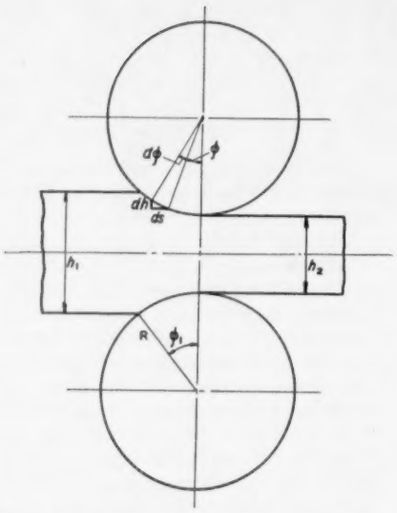


Fig. 1—Rectangular section passing between two rolls

all vertical as well as horizontal forces cancel each other.

With the aid of equation (1), we shall now investigate whether the slippage becomes zero at some point on the contact surface. In order to simplify the matter, it is assumed that the width of the bar is constant; that is, that $b_2 = b$. Then:

$$h = h_2 + D\,(1 - \cos\phi).$$

This value for h, substituted in equation (1), gives:

$$\cos^2\phi - \cos\phi\left(\frac{h_2}{D} + 1\right) = -k\frac{h_2}{D} \quad (2).$$

and thus:

$$\cos\phi = \tfrac{1}{2}\left(1 + \frac{h_2}{D}\right) \pm \sqrt{\tfrac{1}{4}\left(1 + \frac{h_2}{D}\right)^2 - k\frac{h_2}{D}}$$

(1) If k is assumed equal to 1, which stipulates that the delivery speed of the bar is equal to the circumferential speed of the roll, and if certain values are given to $\frac{h_2}{D}$, the angles ψ_1 and ψ_2 which satisfy the equation will have the values shown in Table 1.

Table I

$\frac{h_2}{D}$	0°	0.5	0.7	0.8	0.9	1.0
ψ_1	0°	0°	0°	0°	0°	0°
ψ_2	90°	60°	45.5°	37°	26°	0°

In reality, $\frac{h_2}{D}$ cannot exceed 0.8, and since the angle of contact never exceeds 30 degrees ψ_2 can be disregarded for $k = 1$.

(2) If $k<1$, ψ_1 will be imaginary and ψ_2 increasing, thus providing no value between 0 and ϕ_1 that will satisfy the equation.

(3) $k>1$, the angles ψ_1 and ψ_2 will approach each other in value, so that ψ_1 will assume a positive real value and ψ_2 will become less than it is for $k = 1$. Evidently the magnitude of k will determine whether ψ_2 will be less than 30 degrees. In order to judge whether it is actually possible for k to assume a value making ψ_2 less than 30 degrees, we shall first analyze the case in which ψ_2 remains greater than 30 degrees, thus leaving ψ_1 to be the only point at which the velocities are the same. In front of ψ_1, the speed of the roll is greater than that of the bar, while behind ψ_1 the reverse is true. The forces of friction on both sides of ψ_1, are directed against each other, and equilibrium is obtained horizontally around ψ_1. Accordingly, the forces will be directed as shown in Fig. 2. If we assume that the radial rolling pressure is constant throughout the surface, we shall be able to express the conditions required for equilibrium, provided that the friction angles α and the coefficient of friction $\mu = \tan\alpha$ are known. Notation:

dN = normal pressure
dF = frictional force
dK = resultant force
dH = horizontal component of resultant force

Equilibrium is obtained when:

$$\sum_{\psi}^{\phi_1} dH = \sum_{0}^{\psi} dH_1$$

$$\int_{\psi}^{\phi_1} dK\cos(90 - \alpha + \phi) = \int_{0}^{\psi} dK\cos(90 - \alpha - \phi)$$

$$\int_{\psi}^{\phi_1} \sin(\alpha - \phi)\,d\phi = \int_{0}^{\psi} \sin(\alpha + \phi)\,d\phi$$

After integration is carried out:

$$\sin\psi = \frac{\cos(\alpha - \phi_1) - \cos\alpha}{2\sin\alpha} \quad \ldots\ldots (3).$$

and approximately:

$$\psi = \frac{\phi_1}{2} - \frac{1}{\mu}\left(\frac{\phi_1}{2}\right)^2$$

$$= \sqrt{\frac{h_1 - h_2}{2D}} - \frac{1}{\mu}\cdot\frac{h_1 - h_2}{2D} \quad \ldots\ldots (3a).$$

When ϕ_1 is known, the forward slip can be calculated, because the delivery speed of the bar is determined by the stipulation that at point ψ the circumferential velocity of the roll is the same as the velocity of the bar. The forward slip is:

$$f = \frac{kv_2 - v_2}{v_2} = (1 - \cos\psi)\left(\frac{D}{h_2}\cos\psi - 1\right) \quad \ldots\ldots (4).$$

or approximately:

$$f = \frac{\psi^2}{2}\left(\frac{D}{h_2} - 1\right)100\% \quad \ldots\ldots (4a).$$

Then

$$k = 1 + f = \cos\psi\left(1 + \frac{D}{h_2}\right) - \frac{D}{h_2}\cdot\cos^2\psi \quad \ldots\ldots (4b).$$

Equation (4b) is thus the solution of equation (2) with respect to k, when ϕ is known.

For the foregoing extreme case:

$$\frac{h_2}{D} = 0.8$$

If $\mu = 0.6$ and $\phi_1 = 30° = 0.524$, the following values of ψ_1 and k are found:

$$\psi_1 = \frac{0.524}{2} - \frac{1}{0.6}\left(\frac{0.524}{2}\right)^2 = 0.148 = 8.5°;$$

$$K = 1.0027.$$

If this value of k is substituted in equation (2), ψ_2 will be 36 degrees. Thus it is seen that only ψ_1 need be considered, and that the foregoing case of equilibrium is the one which in reality is generally valid. Between ψ_1 and ψ_2, the slip will reach a maximum value at less than 30 degrees.

The value of the total slippage for a certain revolved angle of the roll is obtained by integration of equation (1):

$$S = R\int d\phi - \int\frac{b_2 h_2 k R\,d\phi}{b\,h\cos\phi} \quad \ldots\ldots (1a).$$

If the integration is carried out between 0 and ϕ_1, the total slippage is obtained for the angle of revolution ϕ_1 of the roll. This slippage, however, is the difference between the positive slip from ϕ_1 to ψ and the negative slip from ψ to 0. Thus, the total slippage can be written as:

$$S_t = (S_0 - \phi_1) - (2S_0 - \psi)$$

In order to integrate equation (1a), it is necessary to express b as a function of ϕ. For rectangular sections, we can assume that the spreading, b_c, is directly proportional to the linear reduction $h_1 - h$. This assumption is based upon measurements, taken in the deformed contact zone, of the

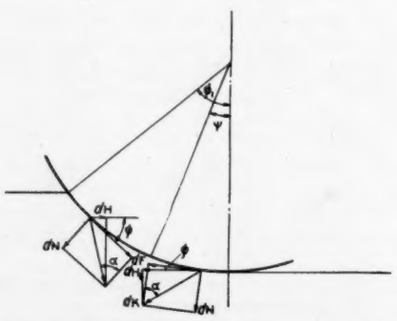


Fig. 2—Distribution of forces on the roll surface

dimensions of bars having rectangular cross sections.

Then:

$$db_r = p.\,2\,dh = p.\,2\,ds.\,tan\,\phi = p.\,D\,sin\,\phi d\,\phi$$

$$b = b_1 + b_r = b_1 + \int_{\phi_1}^{\phi} p.\,D\,sin\,\phi\,d\,\phi$$

$$= b_1 + p\,D\,(cos\,\phi - cos\,\phi_1)$$

$$= b_2 - p\,D\,(1 - cos\,\phi)$$

$$b_2 = b_1 + p\,D\,(1 - cos\,\phi_1)$$

$$= b_1 + p\,(h_1 - h_2)$$

$$p = \frac{b_2 - b_1}{h_1 - h_2}$$

Thus the following expression will be obtained for the total slippage:

$$S = R\int d\,\phi - \int \frac{b_2\,h_2\,k\,R\,d\,\phi}{cos\,\phi\,[b_2 - p\,D\,(1 - cos\,\phi)]\,[h_2 + D\,(1 - cos\,\phi)]}$$

The solution for $b_2 < 2\,p\,D$, between the limited $0 - \phi$, is:

$$S = R\,\phi - \frac{h_2\,D\,k}{h_2 + Dk}\left[g\,log_e \frac{1 + tan\frac{\phi}{2}}{1 - tan\frac{\phi}{2}} + i\,tan^{-1}\frac{tan\frac{\phi}{2}}{\gamma} + j\,log_e \frac{\alpha + tan\frac{\phi}{2}}{\alpha - tan\frac{\phi}{2}}\right] \quad \text{.....(1b);}$$

in which:

$$g = \frac{2\,\alpha^2}{(\gamma^2 + 1)\,(\alpha^2 - 1)};$$

$$i \frac{(\gamma^2 - 1)^2\,\alpha^2}{\gamma\,(\gamma^2 + 1)\,(\alpha^2 + \gamma^2)};$$

$$j = -\frac{(\alpha^2 + 1)\,\alpha}{2\,(\alpha^2 - 1)\,(\alpha^2 + \gamma^2)};$$

$$\gamma = \sqrt{\frac{h_2}{h_2 + 2\,D}}$$

$$\alpha = \sqrt{\frac{b_2}{2\,p\,D - b_2}};$$

$$\alpha^2 = \frac{b_2}{2\,p\,D - b_2}$$

For $b_2 > 2\,p\,D$, the last term within the bracket is to be replaced by

$$-2\,j\,tan^{-1}\frac{tan\frac{\phi}{2}}{\alpha};$$ and for $b_2 = 2\,p\,D$, this term should be replaced by

$$-\sqrt{\frac{1 - cos\,\phi}{1 + cos\,\phi}}$$

In a similar manner, the displaced volume can be calculated. The displaced volume is defined as the product of the distance through which the working force moves by the area perpendicular to that force. Because of the fact that a certain slippage always occurs between the working roll surface and the worked material, one should be entitled to differentiate between the "ideal displaced volume" V_i, and the real displaced volume V_v. The ideal displaced volume V_i then is defined as the displaced volume for a certain revolved angle of the roll when the material follows the roll without slip, while V_v expresses the displaced volume for the same case except that slippage occurs between rolls and material.

From Fig. 1 it will be seen that the displaced volume d^2V, corresponding to the movement ds of the bar section, is:

$$d^2V = 2b.\,ds.\,dh \quad \text{.....(5).}$$

while ds and dh in turn correspond to the revolved angle $d\phi$ of the roll. If the speed of the bar is equal to the circumferential speed of the roll, the following expressions are valid:

$$ds = Rd\phi\,.\,cos\,\phi;$$

$$dh = ds\,.\,tan\,\phi = Rd\,\phi\,.\,cos\,\phi\,.\,tan\,\phi$$

Thus:

$$d^2V_i = 2b\,.\,ds\,.\,dh$$

$$= 2b\,.\,R^2\,.\,tan\,\phi\,.\,cos^2\,\phi\,.\,d\,\phi^2 \quad \text{....(5a).}$$

On the other hand, if we consider the real speed v of the bar, which is:

$$v = \frac{b_2\,h_2}{b\,h}\,.\,kv_2$$

and if this expression for v is introduced in $ds = v\,.\,dt$ and $dh = ds\,.\,tan\,\phi$; we obtain, considering that $dt = Rd\,\phi$:

$$dh = \frac{b_2\,h_2}{b\,h}\,.\,k\,.\,Rd\,\phi\,.\,tan\,\phi$$

$$ds = \frac{b_2\,h_2}{b\,h}\,.\,k\,.\,Rd\,\phi$$

$$d^2V_v = 2b\,.\,ds\,.\,dh = 2b\left(\frac{b_2\,h_2}{b\,h}\,.\,k\,R\right)^2 tan\,\phi\,.\,d\,\phi^2 \quad \text{.....(5b).}$$

If the influence of spreading is disregarded, so that $b_2 = b = b_1$, and if h is expressed as $h = h_2 + D\,(1 - cos\,\phi)$ we can investigate the conditions under which d^2V_i equals d^2V_v. Thus, by equating equations (5a) and (5b), we obtain:

$$R^2\,.\,tan\,\phi\,.\,cos^2\,\phi\,.\,d\,\phi^2 = \left[\frac{h_2}{h_2 + D\,(1 - cos\,\phi)}\,.\,k\,.\,R\right]^2 tan\,\phi\,.\,d\,\phi^2,$$

which can be simplificd to:

$$cos^2\,\phi - cos\,\phi\left(1 + \frac{h_2}{D}\right) + k\,.\,\frac{h_2}{D} = 0.$$

As could be expected, this equation is identical with equation (2). Accordingly, the conclusion is that the ideal and real displaced volumes are equal when the slip is equal to zero.

Equation (5a), integrated between 0 and ϕ, gives:

$$V_i = 2R^2\phi\int [b_2 - p\,D\,(1 - cos\,\phi)]\,sin\,\phi\,.\,cos\,\phi\,.d\,\phi = R^2\phi[(b_2 - p\,D)\,sin^2\,\phi + 2/3\,p\,D\,(1 - cos^3\,\phi)] \quad \text{.....(6).}$$

Equation (5b), integrated between the same limits, provides the result:

$$V_v = 2(k\,.\,b_2\,.\,R)^2\phi\left(\frac{a\,log_e\,C - e\,log_e\,f}{b_2 - p\,D} + g\right) \quad \text{.....(7);}$$

in which:

$$a = \frac{1}{(h_2 + D)^2};\quad c = \frac{D\,h_1}{h_2(h_2 + D - h)};$$

$$e = \left(\frac{p}{b_1 + p\,h_1}\right)^2;\quad f = \frac{b_2\,h_1}{b_1\,h_2};$$

$$g = \frac{h_1 - h_2}{h_1\,.\,h_2\,(h_2 + D)\,(b_1 + ph_1)};\quad p = \frac{b_2\,b_1}{h_1\,h_2}$$

Equation (7) is therefore the theoretically correct expression for the displaced volume of rectangular sections. For the sake of comparison, the formulas previously derived for calculation of the displaced volume are as follows:

I. Puppe, in *Stahl und Eisen* 1909, defines the displaced volume as the product of the reduction of area by the entering length of the bar. This is:

$$Ve_1 = l_1\,(b_1h_1 - b_2h_2)$$

which also can be written as:

$$Ve_1 = R\,.\,\phi\,.\,k\,\frac{b_2\,h_2}{b\,h}\,(b_1h_1 - b_2h_2) \quad (8).$$

II. Holmgren, *Jernkontorets Annaler* 1919, defines the displaced volume as the product of the reduction of area by the delivered length of the bar. This is:

$$Ve_2 = l_2\,(b_1h_1 - b_2h_2) = R\,.\,\phi\,.\,k\,(b_1h_1 - b_2h_2) \quad \text{.....(9).}$$

III. Preussler, *Stahl und Eisen* 1920, gives the same relation that is valid for compression between plane parallel surfaces. This is:

$$Vln = R\,.\,\phi\,.\,k\,.\,b_2\,.\,h_2\,.\,log_e\frac{h_1}{h_2} \quad (10).$$

where $R\,.\,\phi\,.\,k\,.\,b_2\,.\,h_2$ represents the volume of the worked bar.

(To be continued)

Making the Most of

METHODS AND MATERIALS

PHOTOELECTRIC cell equipment is being used to stop the flow of oil into oil-burning boilers in case the fire goes out. One installation consists of a cell mounted on a pipe which leads directly into the burner, being so placed as to be kept cool and thus prevent damage by heat from the burner. Unlike most installations in which an electric lamp is the light source, the source in this case is the ray of light coming from the flame in the boiler. The cell is housed immediately outside the boiler wall, and the light is conducted through the pipe. Connecting the cell is a sensitive relay which energizes a power relay and closes its contacts. When the fire burns properly, the light beam strikes the cell and the contacts remain closed, completing a circuit through the starter coil which holds the starter in running position and operates the blower and oil valve. If the fire goes out, however, the light fails and the starter coil is de-energized. This stops the blower motor and closes the electrically-operated valve.

S S S

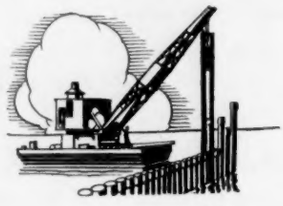
During the past year a zinc manufacturer has made 59 weight of coatings determinations on commercially plated rolled zinc and zinc die castings. These tests indicated 0.0003 inch to be the minimum for a satisfactory coating. Only 12 per cent of the coatings measured were of suitable thickness for acceptable service, and these were all 0.0003 inch thick and over. Thirty-four per cent of the measurements ran under 0.0001 inch.

S S S

IN PREPARING the rubber which is to be vulcanized around the fabric carcass of an automobile tire, it is important that no foreign material be permitted to impregnate itself in the rubber and cause an imperfection. For this reason, a large tire manufacturer uses a rust-proofing process for its steel molds. This makes certain that no rust spots or pits form on the molding surfaces. It has been found that treatment of the molds in the rust-proofing tanks makes reconditioning easier and less expensive and prevents rust while the mold is in storage. Moisture and heat, as well as the various chemicals used in rubber making, such as ammonia, sulphur, and the like, are rust promotors. In addition to tire molds, this company also uses rust proofing on hard rubber molds, inner tube spindles, and shop equipment such as chains, chain hoists and tools.

S S S

A dock made largely of saw mill slabs and dirt caved in on one side. Interlocking steel piling, 34 feet long, ⅜-inch thick and 10 inches wide, was being driven along this 600-foot side as part of the repair work, but great difficulty was experienced because the blunt ends of



the piles offered considerable resistance to being driven through the wooden slabs of the fill. By using the cutting blowpipe to cut a point on each pile and three or four teeth, all scarfed on each side, the pile driving was speeded up materially.

S S S

It is of the greatest importance that the common faults of roll grinding—flats, chatter, grit, and traverse marks—be not covered up by a wheel that is limited to a polishing action. It is an inescapable fact that high accuracy and a fine surface can be obtained only by a cutting action. Any attempt to produce a high finish with wheels that have been dulled by dressing will result only in burnishing, which consists largely of the folding over of high metal ridges. This action produces a pleasing appearance, but it lasts only for a short rolling period, after which the pushed-over metal flakes off from the roll, exposing the original surface defects.

S S S

Porcelain enamel recently has been applied to two products of an eastern stove works. One is table tops for packing tables for silk hosiery mills. The silk does not catch and cause runners as is the case when plain metal tops are used. The second product is steel pipe which is enameled on the inside to act as an insulator and to prevent rust in an instantaneous electric water heater.

S S S

ONE of the most notable features of latest designs in German machines is that motor drives are built into and comprise an integral part of the equipment, making a much neater and more symmetrical appearance than was possible under the old arrangement of having the motor on a flange at the side or placed above the headstock or under the bed.

S S S

Early researches, confirmed by more recent practice, have shown that a minimum of 20 per cent nickel must be added to an ordinary cast-iron base to give an austenitic structure. For practical purposes in this case, it generally is found desirable to increase the amount of austenite-forming elements 3 to 5 per cent above the minimum value to insure castings which are fully austenitic in all sections and under all conditions.

S S S

Nickel steel welding rod is coming into wide use in building up rail ends. One railroad has found that the life of rails can be increased substantially by use of a coated rod containing 5 per cent nickel with a maximum carbon content of 0.17 per cent. In general the hardness of normal rail metal, after it has been subjected to the cold working effect of the wheels, averages 38 to 40 scleroscope, corresponding to about 260 brinell. After building up with the nickel steel rods, the hardness is about 50 to 55 scleroscope, or 325 to 350 brinell.

HERE IS THE WAY . .
To Cut
CHIPPING COSTS

Speed your billets through a BONNOT-LENTZ MECHANICAL BILLET CHIPPER.

This self-contained unit performs with splendid efficiency on all alloy and carbon steels now chipped by air methods.

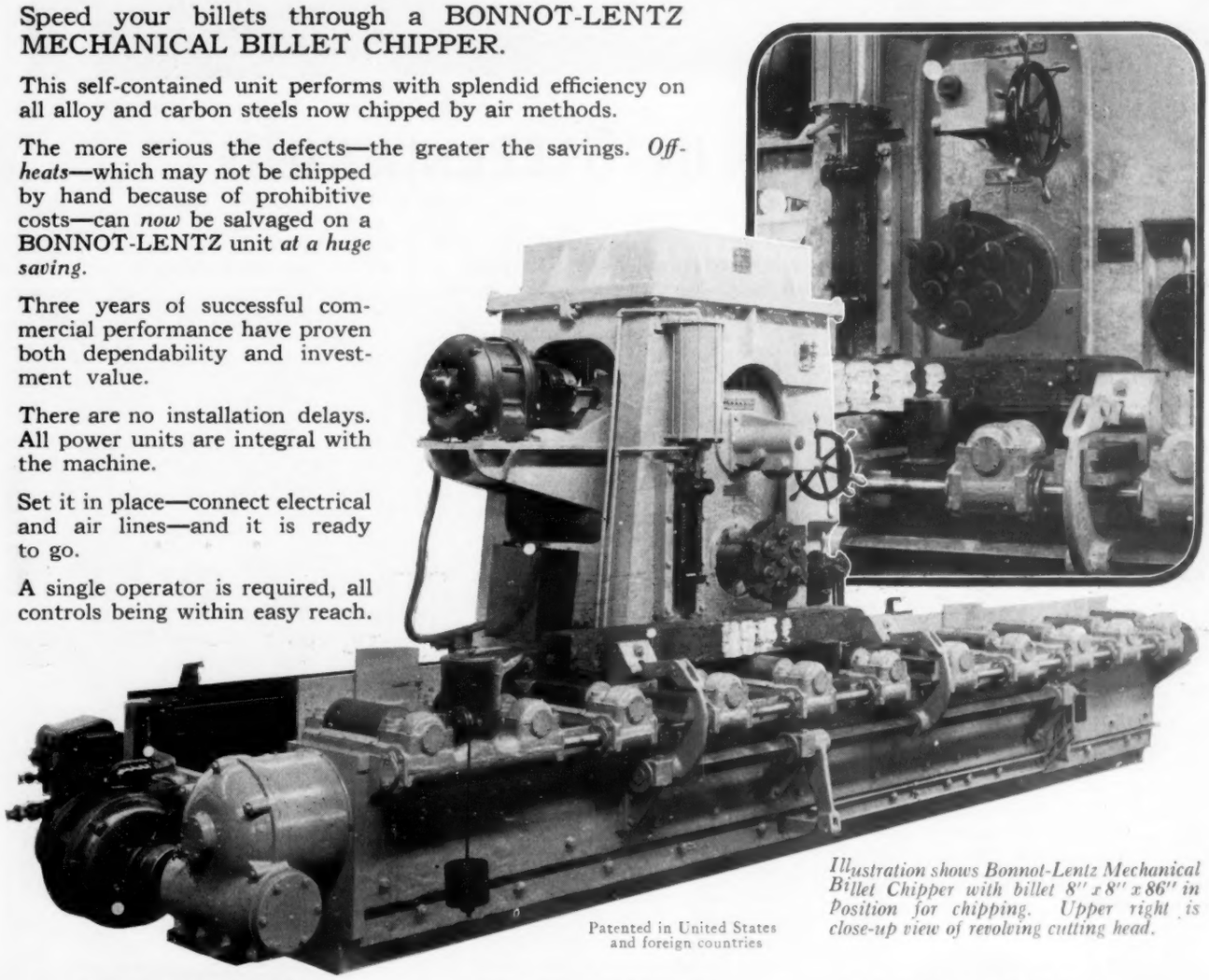
The more serious the defects—the greater the savings. *Off-heats*—which may not be chipped by hand because of prohibitive costs—can *now* be salvaged on a BONNOT-LENTZ unit *at a huge saving.*

Three years of successful commercial performance have proven both dependability and investment value.

There are no installation delays. All power units are integral with the machine.

Set it in place—connect electrical and air lines—and it is ready to go.

A single operator is required, all controls being within easy reach.



Patented in United States and foreign countries

Illustration shows Bonnot-Lentz Mechanical Billet Chipper with billet 8" x 8" x 86" in Position for chipping. Upper right is close-up view of revolving cutting head.

POWERFUL • FLEXIBLE • EFFICIENT

The machine is exceedingly flexible, so that seams and defects may be removed in any lateral direction or to any depth with a *minimum amount of waste.*

Demonstration may be arranged. Performance data is available.

Send for an engineer to discuss possible savings in your plant. No obligation.

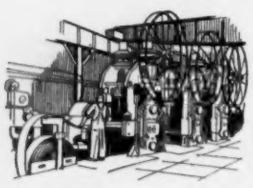
The Bonnot Company
CANTON, OHIO
Steel Equipment Division

PROGRESS IN STEELMAKING

ALLOY steel rolls with a scleroscope hardness ranging from 80 to 90 and penetrating to a depth of 2 to 3 inches still are in the finishing mill housings of a 4-high strip mill in the Pittsburgh district after two years of service. Redressing during this campaign has reduced the body diameter more than 1 inch but has not affected the hardness of the roll face to any marked extent. The uniformity of the structure and high hardness value prevent tail marking the surface of the roll and also the strip, and lessen the orange-peel effect on the cold-rolled product.

♦ ♦ ♦

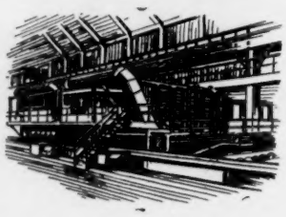
Removing iron and steel chips from the human eye is the purpose of a magnetic instrument intended for use in steel plants where workmen engaged in chipping and grinding frequently suffer from such eye trouble. The device is equipped with a rectifier and magnet made of finely divided iron. The latter is enclosed in a special tube with the proper winding.



OPERATION of a reel serving a cold strip mill at an Ohio plant now is controlled by a photoelectric tube. The latter is mounted on the housings at the rear of the mill and above the runout table. When the front end of the strip is ejected from the rolls and passes beneath the photoelectric tube, it cuts off a beam of light between the source and tube. Shutting off the light de-energizes the tube, which in turn causes control equipment to actuate the reel. When the rear end of the strip leaves the mill and permits the light again to pass to the tube, the chain of operations are reversed and the reel is brought to rest.

♦ ♦ ♦

Tantalum carbide tips for tube drawing mandrels now are being mounted on the body of the mandrel by a recently developed construction which involves the use of special alloys. Tantalum carbide tipped mandrels are coming into wider use on account of the low coefficient of friction and low thermal conductivity of the alloy.



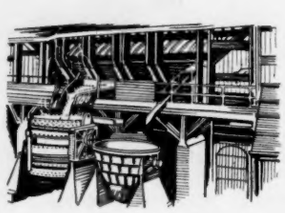
HIGH temperature in billet, slab, forging and other steel mill reheating furnaces now can be recorded and controlled with sustained accuracy by a recently developed supersensitive radiation tube and rapid recorder. The tube is a compact, self-contained unit which records temperature changes practically instantaneously, having a time lag of about 2 seconds. The device also can be employed for measuring the temperature of billets, rods, sheets, etc. in the process of reduction. On account of the rapid travel of the chart, the recorder gives a legible production record for any specified period.

♦ ♦ ♦

Shearing strip steel from 0.006 to 0.025-inch thick and up to 36 inches wide into any length from 12 to 26 inches in increments of 1/64-inch, and from 26 to 52 inches in increments of 1/32-inch, now is possible by the recent development of a new precision high-speed flying shear. The unit operates continuously, is full automatic and has a maximum speed of 300 feet a minute. The gear box is designed for a total of 832 speed changes which are obtained through three levers located on the exterior. Approximately 80 seconds are required to effect a gear change and not over 20 seconds to change guides. The shear knives may be set while the machine is in operation.

♦ ♦ ♦

Cement lined steel pipe has been developed by a pipemaker in the Pittsburgh district for use in underground water supply lines, industrial water piping, coal mine drainage lines, oil field applications and for handling various corrosive solutions. The new commodity is produced from the same grade of steel used for standard black and galvanized butt and lapwelded pipe. The purpose of the cement lining is to render the steel corrosion proof, the metal supplying the necessary reinforcement to protect the lining from mechanical damage likely to be encountered in service.



REDUCING the total amount of heat radiated per hour from a 100-ton open-hearth furnace from 9 million to 4 million B.t.u. per hour, is possible by insulating the exposed surface above and below floor line. This saving is from 8 to 10 per cent of the fuel used per heat. Approximately 3 million B.t.u. are saved by insulating the portion of the furnace above the floor line.

WHEN STRONG WELDS *must be* A CERTAINTY

In salvaging a huge broken crankshaft by welding there can be no compromise with fine workmanship and fine wire. Strong welds must be a certainty. On such work, Roebling Welding Wire demonstrates the value of Roebling's *special manufacturing methods.*

Made of pure metals, in *small* open-hearth furnaces that permit close control of the melt and exact refining, Roebling Welding Wire is bound to be pure and uniform. You can rely upon it to *consistently* produce welds of superior strength and durability.

Try this fine wire—see how it works. Our nearest office below will gladly send samples of Roebling Wire for either gas or electric welding.

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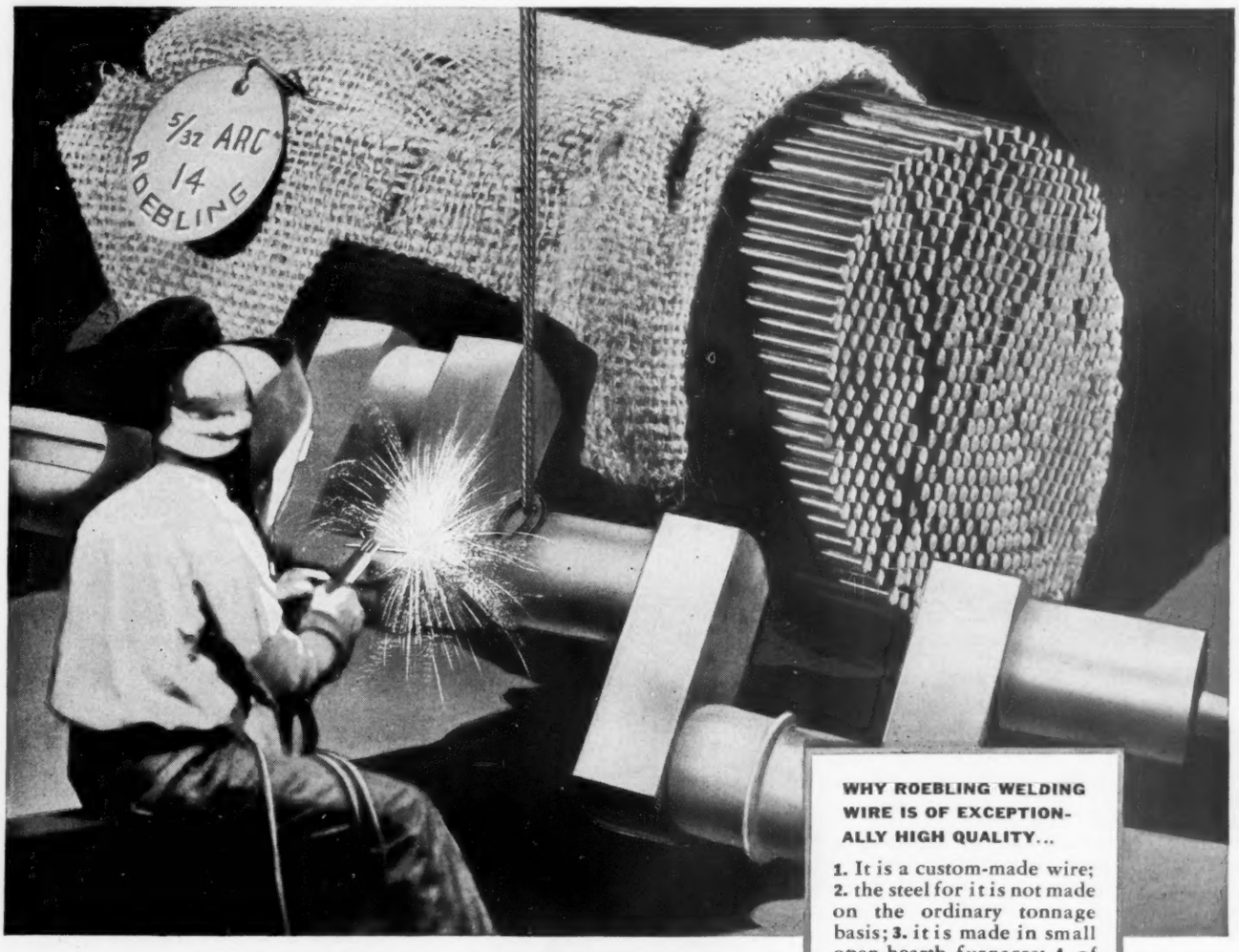


WHY ROEBLING WELDING WIRE IS OF EXCEPTIONALLY HIGH QUALITY...

1. It is a custom-made wire; **2.** the steel for it is not made on the ordinary tonnage basis; **3.** it is made in small open-hearth furnaces; **4.** of special melting stock; **5.** and is produced by Roebling's special methods; **6.** painstaking care is exercised throughout manufacture.

ROEBLING

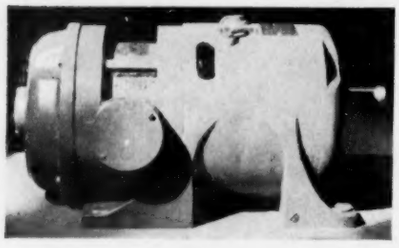
THE CUSTOM-MADE WELDING WIRE—FOR EXACTING WELDERS

NEW EQUIPMENT

PRODUCTION FABRICATION TREATMENT FINISHING

Gearmotors Built in Wide Range of Ratios

Reliance Electric & Engineering Co., 1042 Ivanhoe road, Cleveland, is manufacturing gearmotors in sizes rated ¾-horsepower and up. These drives, shown herewith, combine motor and speed reducer into one compact and fully protected unit. A carriage-type gear unit carries all gears and bearings except the high speed pinion and bearing. The carriage can be removed without disturbing the alignment of any gears or bearings. A simple train of helical gears is employed. The ratio of any unit can be changed



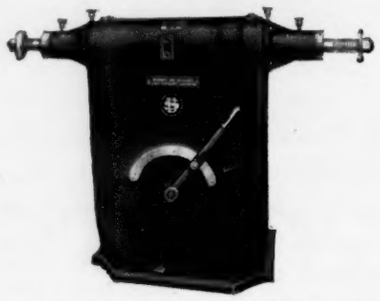
Simple train of helical gears simplifies Reliance gearmotor

by the user by simply changing the high speed pinion and gear. Rotating the cartridge gear unit provides 4 to 8 positions of the output shaft. The units can be supplied for a wide range of ratios with both alternating and direct current motors of various types.

◆

Speed Variation Features Buffer and Polisher

United States Electrical Tool Co., Cincinnati, has developed a new variable speed buffer, polisher and grinder, shown herewith, for use on alternating current circuits. It is claimed that it provides speeds not available in directly connected units to standard cycle alternating system. The variation in speed is obtained through a selective gear drive which is said to be simple in design, positive in action, and flexible in speed. The composite gear drive provides four wheel speeds from 2000 to 3000 revolutions per minute or any range desired. Speeds can be changed through the lever mounted on the front of the machine. In the grinder type machines, it is said that the selective speed gears are interlocked with the lever so that it is



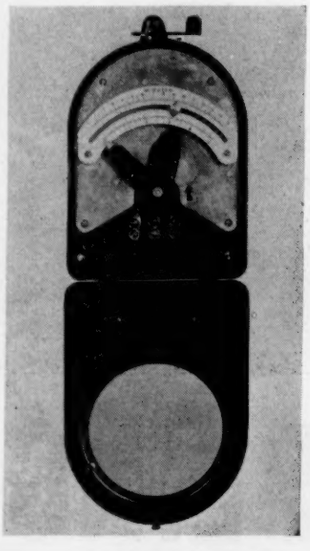
Buffer, polisher, grinder developed by U. S. Electrical Tool Co.

impossible to operate the grinding wheels at a dangerous rate of speed. Also the guards are adjusted for various wheel diameters and wheel wear.

◆

Designs Timer for Remote Control Application

General Electric Co., Schenectady, N. Y., recently placed on the market electric timers that lend themselves to many automatic and remote control applications. By combinations of two or more timers, or by using one in conjunction with other types of automatic time switches, it is possible to meet a wide range of process schedules. The timer, designated type TSA-10, is shown herewith. Timing is started by closing a switch. Resetting is automatic when the control circuit is de-energized. The time period is adjustable over a wide range. When employed as a process timer, the unit can be arranged to operate a signal or terminate a process at the end of a predetermined period.

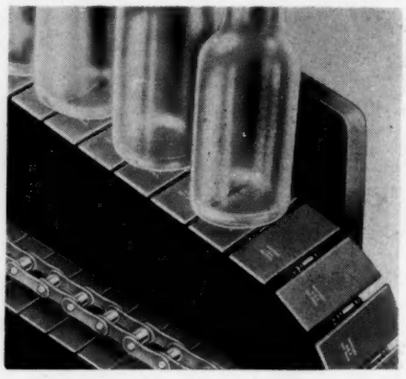


Type TSA-10 General Electric timing device

◆

Stainless Steel Employed for Conveyor Chain

Whitney Mfg. Co., Hartford, Conn., by utilizing the recognized features of the standard finished roller chain and adapting them to slower speed conveyor work, has developed a conveyor chain for use on various types of machinery. The pitch dimension of the new chain, shown herewith, is double the standard roller chain pitch which allows it to run on standard cut



Chain conveyor recently introduced by Whitney Mfg. Co.

sprockets, the rollers meeting every other tooth. Outside dimensions of the smaller sprockets are adjusted to compensate for the change in chordal distance to the extended pitch. The chain can be furnished in various combinations of stainless steel parts or in all stainless steel construction.

◆

Steel Tape Available in Two Types of Graduations

Lufkin Rule Co., Saginaw, Mich., is introducing a small tape rule which constitutes a practical 6-foot measure, weighs 2 ounces and has a 1⅝-inch case. Rules can be supplied in two types of graduations. One is graduated in sixteenths of an inch while the other in addition to that carries graduations in tenths and hundredths of a foot.

Rate Down to 51; Code Clarification Awaited

Further Reduction in Steelworks Operations Expected as Unfilled Orders Fall—Confidence Still Strong—Some Good Tonnages in Market

CLARIFICATION of the industrial code situation, now confusing to iron and steel producers and consumers, is expected to supply a strong impetus for terminating the present intermission in buying, which has reduced steelworks operations 3 more points to 51 per cent.

Seasonal influences have added some weight to the inability of purchasers to determine what effect the codes will have on costs and prices, and as a consequence the decline in operations has become more rapid, with prospect of further reduction in the national average this week. The rate is down 6 points to 48 per cent at Chicago; 5 to 53 at Buffalo; 4 to 60 at Youngstown; 2 to 77 at Cleveland; 2 to 46 at Pittsburgh; 2 to 40½ in eastern Pennsylvania.

Confidence in an early fall revival still is strong, aided to some extent by the more rapid progress now being shown in the formulation and application of the codes. General expectation of higher prices in the fourth quarter is bolstering shipments, and to a lesser extent leading to some additional purchasing.

Finishing mill operations are slowing, but in contrast with most finished steel lines a fairly heavy demand persists for sheets and tin plate. A Pittsburgh interest booked 10,000 tons of tin plate in one lot; orders for 2000 tons are frequent. Refrigerator manufacturers are nearing the close of an active production season, but demand for some other sheet specialties during the week increased. Argentina is in the market for 43,000 tons of galvanized sheets.

Automobile steel specifications are continuing surprisingly good beyond the seasonal peak reached in July. Assembly schedules, however, are slower, and except for some orders for Ford's new model, not much buying is expected before September.

In pipe some unusually good business is developing: 7000 tons placed for a Kansas gas line with an Ohio mill; and 1500 tons, additional to 10,000 awarded a week ago, for the Western Gas Co.'s Arizona line. Minnesota Northern Natural Gas Co. is negotiating for a 65-mile extension. For Cleveland watermains 5000 tons of steel pipe and 18,000 tons of cast are active.

Bids are to be taken shortly on 87,600 tons of steel for a dam at Grand Coulee, Wash., financed with $63,000,000 federal funds. The war department has issued specifications for $60,000,000 worth of hangars and barracks. The Gulf Pacific Mail Lines is placing a vessel requiring 3700 tons of steel. Structural shape awards are moderate at 9296 tons. A loan has been authorized for the Triboro, New York, bridge, requiring 105,000 tons of steel.

Heavier railroad purchasing is anticipated as an early fall development. Some of the middle western shops that operated ten days in July are working through this month, though others are on vacation. Chesapeake & Ohio is completing plans for purchasing 25,000 tons of rails; Union Pacific is expected to award 5000 tons. Consumers benefit by expiration of the emergency freight surcharges Sept. 30, which the commerce commission refused to extend.

A steadily rising volume of pig iron shipments is traceable in part to orders for castings, but more especially to consumers' fears that under the industrial code low-priced material not specified before Sept. 30 will be canceled. Silveries and bessemer ferrosilicons are up $1 to $1.50. Six thousand tons of Royal Dutch iron has arrived at Philadelphia. Though the movement of scrap is not so brisk, prices are strong, except some grades at Chicago. Coke is easier.

Iron ore is being shipped down the lakes at a 4,300,000-ton rate for this month. The number of carriers in service has risen 69 to 185, compared with 17 a year ago.

STEEL's iron and steel composite remains $30.02; the finished steel composite $47.50; while the scrap figure is down 4 cents to $11.54.

Composite Market Averages

	Aug. 19	Aug. 12	One Month Ago July, 1933	Three Months Ago May, 1933	One Year Ago Aug., 1932	Ten Years Ago Aug., 1923
Iron and Steel Composite	$30.02	$30.02	$29.81	$28.45	$29.32	$44.87
Finished Steel Composite	47.50	47.50	47.20	45.10	47.46	68.33
Steelworks Scrap Composite	11.54	11.58	10.66	9.23	6.25	15.90

Iron and Steel Composite:—Pig iron, billets, slabs, sheet bars, wire rods, tin plate, nails, sheets, plates, shapes, bars, and black pipe. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate pipe. Steelworks Scrap Composite:—Melting steel, compressed sheets.

COMPARATIVE PRICES OF IRON, STEEL AND COKE

Representative Market Figures for Current Week, Last Month, Three Months and One Year Ago

	Aug. 19, 1933	July 1933	May 1933	Aug. 1932
Pig Iron				
Bessemer, del. Pittsburgh	18.26	17.86	16.66	15.76
Basic, valley	16.00	15.60	14.40	14.00
Basic, eastern, del. eastern Pa.	17.19	16.79	15.44	13.85
No. 2 foundry, del. Pittsburgh	17.76	17.36	16.16	15.76
No. 2 foundry, Chicago	17.00	16.75	15.90	15.50
*Southern No. 2, Birmingham	13.00	12.60	12.00	11.00
**No. 2X Virginia furnace	18.75	17.75	17.75	17.81
**No. 2X, Eastern, del. Phila.	17.63	17.28	15.95	14.38
Malleable, valley	16.50	16.10	14.90	14.50
Malleable, Chicago	17.00	16.75	15.90	15.50
Lake Superior charcoal, del. Chi.	23.04	23.04	23.04	23.04
Gray forge, del. Pittsburgh	17.13	16.93	16.03	15.63
Ferromanganese, del. Pittsburgh	87.24	84.44	73.24	73.24

*1.75-2.25 silicon. **2.25-2.75 silicon.

Delivered pig iron prices subject to 10 per cent freight surcharge, maximum 18.44c per gross ton, beginning Jan. 4, 1932.

Coke				
Connellsville, furnace, ovens	2.50	2.40	1.75	2.00
Connellsville, foundry, ovens	3.00	2.85	2.25	2.90
Semifinished Material				
Sheet bars, open-hearth, Youngs.	26.00	26.00	26.00	26.00
Sheet bars, open-hearth, Pitts.	26.00	26.00	26.00	26.00
Billets, open-hearth, Pittsburgh	26.00	26.00	26.00	26.00
Wire rods, Pittsburgh	35.00	35.00	35.00	37.00

	Aug. 19, 1933	July 1933	May 1933	Aug. 1932
Finished Material				
Steel bars, Pittsburgh	1.60	1.60	1.60	1.60
Steel bars, Chicago	1.70	1.70	1.70	1.70
Steel bars, Philadelphia	1.91	1.91	1.91	1.91
Iron bars, Chicago	1.65	1.65	1.65	1.65
Shapes, Pittsburgh	1.60	1.60	1.60	1.60
Shapes, Philadelphia	1.81½	1.65	1.65	1.75
Shapes, Chicago	1.70	1.70	1.70	1.70
Tank plates, Pittsburgh	1.60	1.60	1.50	1.60
Tank plates, Philadelphia	1.79½	1.49½	1.49½	1.79½
Tank plates, Chicago	1.70	1.70	1.70	1.70
Sheets, No. 10 blue anneal., Pitts.	1.65	1.75	1.55	1.70
Sheets, No. 24, hot ann., Pitts.	2.25	2.25	2.00	2.15
Sheets, No. 24, galvan., Pitts.	2.85	2.85	2.70	2.80
Sheets, No. 10 blue anneal., Chi.	1.95	1.95	1.75	1.85
Sheets, No. 24 hot ann., Chicago	2.40	2.40	2.20	2.35
Sheets, No. 24 galvan., Chicago	3.00	3.00	2.85	3.00
Plain wire, Pittsburgh	2.10	2.10	2.10	2.20
Wire nails, Pittsburgh	2.10	2.05	1.85	1.95
Tin plate, per base box, Pitts.	4.25	4.25	4.25	4.75
Scrap				
Heavy melting steel, Pitts.	$13.75	12.70	11.65	8.55
Heavy melting steel, eastern Pa.	12.00	10.55	9.00	6.37½
Heavy melting steel, Chicago	10.25	10.45	8.70	5.40
No. 1 wrought, eastern Pa.	13.00	11.60	10.25	6.25
No. 1 wrought, Chicago	10.35	10.20	8.10	4.50
Rails for rolling, Chicago	11.25	11.15	10.25	6.50

Sheets

Mill Operations Taper—Specialties in Better Demand—Argentina Inquiring for 43,000 Tons

SHEET PRICES, PAGE 37

Pittsburgh—A sagging sheet market was revived last week when orders made up as good a total as any week in June. Tonnage buying was considerably improved over the July rate, and included attractive specifications of several thousand tons in electrical, autobody and other full-finished grades. The common grades, mainly black and galvanized sheets, likewise shared the improvement. On new business, the following prices are quoted, and are being obtained for spot requirements: 2.25c, Pittsburgh, for black; 1.65c for blue annealed; and 2.85c for galvanized. Prices on autobody sheets continue unsettled.

Cleveland—Operations at sheet mills which have been supported mainly by automotive requirements are showing up. One mill in an adjacent district did not operate last week, though returning to production this week. Another mill interest here that recently was at capacity now is working 60 per cent. No indications of heavy resumption of buying by the automotive industry have appeared.

Refrigerator interests are moving into a seasonal lull; barrel manufacturers appear a little more active. A notable feature is the confidence with which producers regard an early fall pick up. Prices are steady.

Chicago—Despite a decrease in new business, sheet shipments continue heavy and in steady volume. Backlogs are being reduced, however, and with automotive requirements expected to moderate in September, reduced operations are anticipated next month. Little change is noted in requirements of farm implement manufacturers which still are light, while fair tonnages are being taken for manufacture of various brewing equipment. Current prices are being extended only through the balance of this quarter.

New York—An inquiry for 43,000 tons of galvanized sheets is being figured here for the Argentine state government. The sheets are to be used for fencing, in the government's locust prevention campaign. The sheets will be 18 inches high and will be fitted together with clips.

Refrigerator sheet specifications, which were expected to taper off around the first of July, are holding up well. It is believed in some quarters that there will be no material recession before next month. Miscellaneous demand has eased, but prices are moderately steady.

North American Iron & Stetel Co., Brooklyn, N. Y., is low on 1314 square feet of corrosion resisting steel sheets at $2399, delivered, Brooklyn and Philadelphia navy yards, and on a like amount for Mare Island and Puget Sound, at $2456; bids Aug. 8.

Boston—Sheet prices appear to be holding on limited spot business at 1.65c, Pittsburgh, for blue annealed; 2.25c, black; and 2.85c. galvanized.

Philadelphia—An order for 400 tons is a leading transaction in the sheet market. Shipments are off slightly. No. 10 hot-rolled are unchanged at 1.65c. Pittsburgh; black 2.25c, and galvanized 2.85c. Cold-rolled sheet prices, mill run, are 1.95c Pittsburgh, for No. 10, and 2.40c for No. 20, with the latter subject to concessions. The delivered carlot price here takes a 35-cent freight rate from Pittsburgh.

Cincinnati—Sheet mills in this district are holding operations near the July rate. New ordering has been in good volume considering seasonal influences. Prices are firm.

St. Louis—New business in sheets has tapered, but shipments continue heavy. Refrigerator manufacturers are specifying less actively than a few weeks ago.

CURRENT FINISHED STEEL PRICES

Delivered prices subject to freight surchage corrected to nearest ½c. Asterisk denotes price change this week

Sheet Steel

HOT ROLLED No. 10
(24 to 48 inches wide)

Pittsburgh, base	1.65c
Chi. dist. mills	1.75c
Chicago, del.	1.80c
New York, del.	2.00c
Birm., base	1.80c
Phila., del.	1.96c
St. Louis, del.	1.84c

HOT ROLLED ANN. No. 10

Pittsburgh, base	1.80c
Chi. dist. mills	1.90c
Chicago, del.	1.95c
Phila., del.	2.11c
New York, del.	2.15c
St. Louis, del.	1.99c
Birm., base	1.95c
San Fran., c.i.f.	2.27½c

HOT ROLLED ANNEALED No. 24

Pittsburgh, base	2.25c
Chi., dist. mills	2.35c
Chicago, del.	2.40c
New York, del.	2.60c
Phila., del.	2.56c
Birm., base	2.40c
St. Louis, del.	2.59c
San Fran., c.i.f.	2.90c

GALVANIZED No. 24

Pittsburgh, base	2.85c
Chi. dist. mills	2.95c
Chicago, del.	3.00c
Phila., del.	3.16c
New York, del.	3.20c
Birm., base	3.00c
St. Louis, del.	3.19c
San Fran., c.i.f.	3.50c

TIN MILL BLACK No. 28

Pittsburgh, base	2.50c
Gary, base	2.60c
St. Louis, del.	2.84c

MILL RUN COLD-ROLLED No. 10

Pittsburgh, base	1.95c
Chicago, del.	2.10c
Philadelphia, del.	2.26c
New York, del.	2.30c

No. 20

Pittsburgh, base	2.40c
Chicago, del.	2.55c
Philadelphia, del.	2.71c
New York, del.	2.75c

AUTO. AND FURNITURE

Pittsburgh, No. 10	2.15c
Pittsburgh, No. 20	2.60c

ENAMELING SHEETS

Pitts., No. 10	2.40c to 2.45c
Pitts., No. 20	2.90c

Tin and Terne Plate

Per 100-lb. box, Pittsburgh

Tin plate, coke base, contract	$4.25
Do., stock	3.75
Long ternes, No. 24 unassorted	2.90c

Gary base, 10 cents higher.

Corrosion, Heat Resistant Alloys

Base, Pittsburgh

18% chrome, 8% nickel sheets, 35c; plates, 31c; bars, 28c.

	A	B	C	D
Bars	19c	20.5c	23c	28c
Plates	21c	22.5c	25c	30c
Sheets	26c	27.5c	30c	35c
Hot Strip	19c	20.5c	23c	28c
Cold Strip	25c	26.5c	29c	34c

Carbon 0.12 and under; no nickel. A has chrome 15% and under. B over 15/18% inc., C over 18/23% inc., D over 23/30%.

Steel Plates

Pittsburgh, base	1.60c
New York del.	1.90c
Phila., del.	1.79½c
Boston, del.	2.02c
Buffalo, del.	1.85½c
Chicago, base	1.70c
Cleveland, del.	1.80½c
Birmingham, base	1.75c
Coatesville, base	1.70c
Sparrows Point, base	1.70c
*Pacific Coast, c.i.f.	2.10c
St. Louis, del.	1.94c

Structural Shapes

Pittsburgh, base	1.60c
Philadelphia, del.	1.81½c
New York, del	1.87c
Boston, del.	2.00½c
Bethlehem base	1.70c
Chicago, base	1.70c
Cleveland, del.	1.80½c
Lackawan., base	1.70c
Birmingham, base	1.75c
Pacific Coast, c.i.f.	2.10c
Do., wide flange	2.20c

Bars

SOFT STEEL

Pittsburgh, base	1.60c
Chicago, base	1.70c
Birmingham, base	1.75c
Lackawan., base	1.70c
Pacific Coast ports, c.i.f.	2.10c
Cleveland, base	1.65c
Philadelphia, del.	1.91c
New York, del.	1.95c
Pitts., forg. qual.	1.75 and 1.85c

RAIL STEEL

Pitts., Buff.	1.50c
Chicago, base	1.50c
Eastern mills	1.50c

IRON

Chicago, base	1.60c to 1.70c
Philadelphia, base	1.60c
Pitts., refined	2.70c to 4.20c

REINFORCING

New billet steel, Chi., Pitts., Buff., Cleve., Birm. (cut lengths)	1.75c
Phila., cut lengths	1.86c

Wire Products

(Prices apply on carload lots. Mixed carloads 10 cents higher; joint carloads up 20 cents; less carloads up 30 cents. Nail extras subject to 10 per cent discount on straight or mixed carload shiped to single consignee.)

F.o.b. mills, 100 lb. keg

Standard wire nails	$2.10
Cement coated nails	2.10
Galvanized nails	3.60

(Per pound)

Polished staples	2.80c
Galvanized fence staples	3.05c
Barbed wire, gal.	2.60c
Annealed fence wire	2.25c
Galvanized wire	2.60c
Woven wire fencing (base column, c.l.)	$55.00

(To Manufacturing Trade)

Plain wire, 6-9 ga	2.10c

Anderson, Ind., and Chicago, $1 over Pitts.-Cleve.; Duluth and Worcester, $2 higher; Fairfield, Ala., $3 higher.

Spring wire	3.10c

Chicago and Waukegan $1 higher, Worcester $2 higher.

Cold-Finished Bars

Base Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs	1.95c
20,000 to 59,999 lbs.	1.90c
60,000 to 99,999 lbs.	1.85c
100,000 lbs. and over	1.82½c

Chicago, Cleveland, Buffalo 5c higher; Detroit, 20c; eastern Michigan 25c.

Shafting

(Turned and ground)
Cumberland, Md., base

1⅛-inch	3.25c
1⅛ to 1½-inch	2.75c
1⅝ to 1⅞-inch	2.60c
1⅛ to 2⅞-inch	2.45c
2⅛ to 6-inch	2.30c

Alloy Steel

Hot rolled, f.o.b. Pittsburgh, Buffalo, Chicago and Massillon, O. Base 2.45c to 2.65c. Differentials to various classes of consumers.

Alloy S.A.E.	Diff.	Alloy S.A.E.	Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.30
2500	2.25	3400	3.20

4100 .15 to .25 Mo	0.50
4600 .20 to .30 Mo. 1.25-1.75 Ni.	1.05
5100 .80-1.10 Cr.	0.45
5100 Cr. spring	0.20
6100 bars	1.20
6100 spring	0.95
Cr., Ni., Van.	1.50
Carbon van.	0.95
9250 (flats)	0.25
9250 (rds., sq.)	0.50

Strip, Hoops, Bands

Hot-rolled strip up to 23 15/16-in. wide, Pitts.	1.65c
Do., Chicago	1.75c
Do., del. Phila.	2.01c to 2.06c
Do., del. N. Y.	2.05c to 2.10c
Cooperage hoop, Pittsburgh	1.75c
Do., Chicago	1.85c
Cold-rolled strip Pitts., Cleve.	2.25c
Worcester, 3 tons or over	2.45c

Rails, Track Material

Stand. rails, mill	$40.00
Relaying rails, Pitts., 20-45 lbs.	$23.00
50 to 75	$20.00
80 to 100	$23.00 to 24.00
Light rails, 25-45, mills	$30.00
Light rails, Chi.	$32.00
Angle bars, mills	2.55c
Spikes, boat, Pitts.	2.65c
Track bolts, base	3.40c
Tie plates, Pitts.	1.90c
Tie plates, Chi.	1.90c

Base, railroad spikes 200 kegs or more; base tie plates, 20 tons or more; differentials for less.

Rivets, Wrought Washers

Struc. c.l., Pitts-Cleve.	2.50c
Struc., c.l., Chi.	2.60c
7/16-in. & smaller, Pitts., Chi., Cleve.	70, 10 and 5 off
Washers, c.l., Pitts. dist.	7.35 off
Do., Chi. dist.	7.00 to 6.75 off

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chi. Discounts to legitimate jobbing or large consuming trade for full-case lots, Dec. 1, 1932, lists.

CARRIAGE BOLTS

All sizes, cut thread	73 off
Rolled thread, ½ x 6 and smaller	73 off
Eagle list	73 off

MACHINE BOLTS

All sizes, cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts without nuts ..... 73 off

Tire bolts	60 off

Stove bolts, 72½-25-10 off in pkgs.; 85 off in bulk, 5000 or more of a size.

Rolled thread machine bolts, ½ x 6 and smaller, 73 off.

NUTS

Semifinished	73 off

HEXAGON CAP SCREWS

Milled	85 off
Upset 1-in., smaller	85-10 off

SQUARE HEAD SET SCREWS

Upset, 1-in., smaller	80 off
Upset, larger than 1-in.	80 off
Headless set screws	75-10 off

Cut Nails, Piling

Cut nails, Pitts.; (10% discount on size extras)	$2.65
Do., less carloads, 5 kegs or more; no discount on size extras	$2.90
Do., less than 5 kegs; no discount on size extras	$3.05
Steel piling, Pitts	1.90c
Steel piling, Buff.	2.00c
Steel piling, Chi.	2.05c

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pittsburgh and Lorain, O., to consumers in carloads, Indiana Harbor, Ind., and Evanston, Ill., 2 points less. Chicago delivered, 2½ points less. Wrought pipe, Pittsburgh base.

BUTT WELD

Steel

In.	Blk.	Gal.
¼ and ⅜	57	38½
½	62	50½
¾	65½	55½
1—3	67½	58½

Iron

½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

LAP WELD

Steel

2	63½	54½
2½—3	66½	57½
3½—6	68½	59½
7 and 8	67½	57½
9 and 10	67	57
11 and 12	66	56

Iron

2	37	22½
2½—3½	38	25
4—8	40	28½
9—12	38	24½

(*Please turn to next page*)

LINE PIPE

Steel

⅛-inch, butt weld	50½
¼—⅜, butt weld	56
½, butt weld	61
¾, butt weld	64½
1—3, butt weld	66½
2-inch, lap weld	62½
2½—3, lap weld	65½
3½—6, lap weld	67½
7—8, lap weld	66½
9—10, lap weld	66
11—12, lap weld	65

Iron

⅛—1½ inch, black and galv. take 4 pts. over; 2½—6 inch 2 pts. over discounts for same sizes, standard pipe list. 8—12 inch no extra. 2-inch line discount unchanged from list prior to April 15, 1933.

BOILER TUBES

C. L. Discounts, f.o.b., Pitts.

Lap Weld Steel		*Charcoal Iron*	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3¾	50	3	17
4	52	3¾—3½	18
4½—6	42	4	20
1½	1	4½	21

On lots of a carload or more, above base discounts subject to preferential of two 5 per cent discounts on steel and 10 per cent on charcoal iron.

Lap Welded Steel—Under 10,000 pounds, 6 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and two 5 per cents. Quantity discounts, same as for hot rolled below. Charcoal Iron—Under 10,000 pounds; 2 points under base; on 10,000 pounds to carload, base and one 5 per cent.

STANDARD COMMERCIAL SEAMLESS BOILER TUBES

Cold Drawn

2—2¼	27	3¼—3½	44
2½—2¾	34	4	46
3	41	4½, 5, 6	36

(On 1—1¾-inch sizes mechanical tubing discounts apply.)

Hot Rolled

2—2¼	33	3¼—3½	50
2½—2¾	40	4	52
3	47	4½, 5, 6	42

Quantity discounts are: Under 10,000 pounds, 10 points and 5 per cent; 10,000 to 24,999 pounds, 6 points and 5 per cent; 25,000 pounds to carload, 2 points and 5 and 5 per cent; carload and over, base discount and 5 and 5 per cent. No extra for lengths up to and including 24 feet. Sizes smaller than 1 inch and lighter than standard gage to be held at mechanical tubes list and discount.

Seamless Tubing

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs. 40%
15,000 ft. or 22,500 lbs. 70%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$35.00-36.00
4-in., Birm.	38.00-39.00
4-in. Chicago	46.40-47.40
6 to 24-in. Chicago	43.40-44.40
6-in. & over, N. Y.	32.00-34.50
4-in. New York	34.50-36.50

Class A pipe $3 over Class B. Stand. fitgs., Birm. base..$90.00

Six to 24-inch, fittings, base; over 24-inch plus $20; 4-inch. plus $10; 3-inch, plus $20; gas pipe fittings, $5 higher.

RAW MATERIAL PRICES

Delivered pig iron prices subject to 10 per cent freight surcharge, maximum 13.44c gross ton, from Jan. 4, 1932, except Buffalo del. at Boston. Asterisk denotes price change.

Pig Iron

Per Gross Ton

FOUNDRY NO. 2

Chicago, furnace	$17.00
Pitts., dist. fur.	17.00
Pittsburgh, del.	17.63-18.13
Valley furnace	16.50
Cleve. fur., loc. del.	16.50
Philadelphia, del.	17.26
Everett, Mass., fur.	17.00
Virginia furnace	17.25
Granite City, Ill.	17.00
St. Louis, del.	17.85
Buff., fur., local del.	17.00
Buffalo, del. Bost.	18.50
Buff., del. Brook.	18.77
Buff., del. Newark.	17.89
Ala., Birmingham.	13.00
Ala., del. Chicago.	17.16
Ala., del. St. Louis.	17.35
Ala., del. Cincinnati	17.51
Ala., Phila., dock.	18.12-18.37
Ala., Balt., dock del.	18.12
Ala., N. Y. dock.	18.62
Ala., Bost. dock del.	18.62-18.87
Tenn., Bir. base	14.00
Tenn., del. Cinci.	17.51
Montreal, del	22.00
Eastern, del. Phila.	17.76

FOUNDRY NO. 2X

Buff., fur., local del.	17.50
Buff., del. Brook.	19.02-19.27
Do., Newark	18.14-18.39
Buffalo, del. Bost.	18.75-19.00
Virginia furnace	17.75
Eastern, del. Phila.	17.51-17.76

FOUNDRY NO. 1X

Buff., fur., local del.	18.00
Eastern, del. Phila.	18.01-18.26
Buff., del. Brook.	19.52-19.77
Buff., del. Newark.	18.64-18.89

MALLEABLE

Valley furnace	16.50
Cleve. fur., loc. del.	16.50
Pittsburgh dis. fur.	17.00
Pittsburgh, del.	17.63-18.13
Chicago, furnace	17.00
Buff., fur., loc. del.	17.50
Eastern Pa., del.	18.13-19.91
Granite City, fur.	17.50
Montreal del.	22.50
Toronto, delivered	21.00

BASIC

Pitts., dist. fur.	16.50
Pittsburgh, del.	17.13-17.63
Eastern Pa., del.	17.00-17.25
Buff., fur., loc. del.	16.50-17.00
Montreal, del.	22.00
Valley, furnace	16.00

BESSEMER

Valley furnace	17.00
Pittsburgh fur.	17.50
Pittsburgh, del.	18.13-18.63

LOW PHOS.

Valley fur. stand.	25.00
Phila., standard	25.76-26.79
Copper, bear., E. Pa. furnace	24.00-25.00

GRAY FORGE

Valley furnace	16.25
Pitts., dist. fur.	16.50
Pittsburgh, del.	17.13-17.63

CHARCOAL

Lake Sup., del. Chi.	23.04

SILVERY

*Jackson County, O., base: 6%—$21.25; 7—$22.25; 8—$23.25; 9—$24.25; 10—$25.25; 11—$26.75.

BESSEMER FERROSILICON

*Jackson County, O., base: 10%—$26.25; 11—$27.75; 12—$29.25; 13—$30.75; 14—$32.25; 15—$33.75; 16—$35.25.

Iron Ore

LAKE SUPERIOR ORE

Gross ton, 51½%, Lower Lake Ports

Old range bess.	$4.30
Mesabi bessemer	4.65
Old range nonbess.	4.65
Mesabi nonbess.	4.50
High phosphorus	4.40

EASTERN LOCAL ORES

Cents, unit, del. E. Pa.

Foundry and basic, 56-63%, con. (nom.)	8.00- 9.00
Cop-free low phos. 58-65% (nom.)	10.00-10.50

FOREIGN ORE

Cents per unit, f.a.s. Atlantic ports (nom.)

Foreign manganiferous ore, 45-55% iron, 6-10% man.	8.50
No. Afr. low phos.	7.00
Swedish basic, 65%	8.00
Swedish lo wphos.	8.50
Spanish, No. Afr. basic, 50 to 60%.	7.00
Tungsten, spot, sh. ton unit, duty pd.	$12.00-12.50
N. F. fdy., 55%	7.00
Chrome ore, 48% gross ton c.i.f.	$17.00-18.00

Manganese Ore

(Nominal)

Prices, not including duty, cents per unit, cargo lots.

Caucasion, 52-55%	22.00
So. African, 52%.	21.00-22.00
So. Afr., 49-51%	20.00-21.00
Indian, 48-50%	nominal

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. Works

First Quality

Pa., Ohio, Ill., Ky., Md., Ga., Mo.	$45.00
Alabama	48.00

Second Quality

Pa., Ohio, Ill., Ky., Md., Mo., Ga., Ala.	40.00

MALLEABLE BUNG BRICK

All bases	50.00

SILICA BRICK

Pennsylvania	$45.00
Joliet E. Chicago	54.00
Birmingham, Ala.	55.00

MAGNESITE BRICK

Per Net Ton, 9 x 4½ x 2½

Burned	$65.00
Unburned	55.00

CHROME BRICK

Per Net Ton

F.c.b. ship. point	$45.00

MAGNESITE

Dead burned grain, Chester, Pa., Baltimore bases, net	40.00
Domes, Chewelah, Wash., base	22.00

Fluorspar

85 to 5 per cent grade

Washed gravel, duty paid, tide, gross ton	$20.00
Washed gravel f.o.b. Ill., Ky., net ton, carloads	$14.00

Semifinished Steel

Prices Per Gross Ton

BILLETS AND BLOOMS

4 x 4-inch base

Pitts., Chi., Cleve., open-hth. & bess.	$26.00
Philadelphia	31.75
Forging, Pitts., Chi.	31.00

SHEET BARS

Pitts., Cleve., Yong.	26.00
Chicago	26.00

SLABS

Pitts., Cleve., Yong.	26.00

WIRE RODS

Pitts., Cleveland	$35.00
Chicago	36.00

SKELP

All grades, Pitts.	1.60c

Coke

Price Per Net Ton

BEEHIVE OVENS

*Connellsville fur.	$2.50
*Connellsville fdry.	3.00
Connell. prem. fdry.	4.50
New River fdry.	6.00
Wise county fdry.	4.25- 5.00
Wise county fur.	3.50- 4.25

BY-PRODUCT FOUNDRY

Newark, N. J., del.	8.21- 8.81
Chi. ov., outside del,	7.50
Chicago, del.	8.25
New England, del.	10.00
St. Louis, del.	7.75
Birmingham, ovens	4.50
Indianapolis, del.	8.25
Ashland, Ky., ovens, Connell. basis	5.00
Portsmouth, ovens, Connel. basis	5.00
Buffalo, ovens	7.50- 8.00
Detroit, ovens	8.00
Philadelphia, del.	8.50

Ferroalloys

(In dollars, except Ferrochrome)

Ferromanganese, 78-82% tidewater, duty pd.	82.00
del. Pitts.	87.24
Spiegeleisen, 19-20%, dom., fur., spot†	27.00
Ferrosilicon, 50%, frieght all., c. l.	74.50
Do, less carload	82.50
Do, 75 per cent.	120-130.00
Spot, $5 a ton higher.	
Silicomang., 2½ carb.	85.00
2% carbon	90.00
1% carbon	100.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del.	9.50
Do, spot del.	10.00
Ferrotungsten, stand., lb. cont.	1.04 -1.10
Ferrovanadium, 35 to 40%, lb. cont., on analysis	2.60- 2.80
Ferrotitanium, c.l., prod. plant, frt. allow., net ton	127.50
Spot, 1 ton, frt., all., lb.	8.50
Do, under 1 ton	9.00
Ferrophosphorus, per ton, c. l. 17-19%, Rockdale, Tenn., basis; 18%, $2 unitage	42.00
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $2.50 unitage	55.00
Ferromolybdenum, stand. 50-60%, lb	0.95
Molybdate, lb. cont.	0.80

†Carloads. Diff. to apply to quantity.

Bars

Selling Is at Slower Rate—New Forging Grade Extra—Prices Holding Firmly

BAR PRICES, PAGE 37

Pittsburgh—Bar producers are quoting spot forging bar inquiries under a new price classification, having one designation over and above base. This will be for guaranteed forging bars and will apply for all sizes, taking an extra of $5 a ton over base. Previously, forging bars had been sold with extras applying according to size. The larger sizes took the $5 extra; intermediate sizes took $3 and the smaller sizes were base. Soft steel bars are moving more slowly and both shipments and specifications are down this month. However, the price of 1.60c, Pittsburgh, is firm. Alloy bars hold unchanged at a base of 2.45c or 2.65c, depending upon the specification.

Cleveland—Bar mills will be shipping through the remainder of this month on July specifications. New business, however, has fallen off considerably and unless automotive and miscellaneous orders revive soon mill operations in this district will be reduced. Railroads are buying sparingly. Commercial steel bars held at 1.65c, base; Cleveland.

Chicago—Steel bar sales and specifications are lighter, with further moderation anticipated with the decline in automotive operations. Shipments are fairly steady, aided by orders placed at the turn of the month, but new buying is expected to continue quiet through August. The 1.70c, Chicago, price still is quoted only on prompt business.

Boston—Users of commercial steel, forging, alloy and tool steel bars continue to buy conservatively. Few have stocked or specified far in advance, although manufacturing consumers generally have business to warrant moderate shipments. Steel bars are steady at 1.60c, Pittsburgh.

New York—With jobbers, shipyards and bolt and nut manufacturers fairly well covered on their nearby requirements, and with railroads showing little interest, demand for commercial steel bars is light. Prices are unchanged at 1.60c, Pittsburgh, or 1.95c, New York. Common iron bars are holding at 1.50c, Jersey City.

Philadelphia—Demand for commercial steel bars has sagged appreciably. Jobbers are well covered and railroads are doing little else but specify on old commitments. Prices, however, are unchanged at 1.60c, Pittsburgh, or 1.91c, Philadelphia. Common iron bars show less firmness, at 1.60c, f.o.b. mill. Bands at 1.65c, Pittsburgh, are still subject to shading of $1 a ton.

Tin Plate Demand Sustained; Order for 10,000 Tons

Tin Plate Prices, Page 37

Pittsburgh—In anticipation of higher tin plate prices, and also with the desire to build up fair inventories, canmakers continue to specify heavily.

This has insured a continuation of a 95 per cent operating rate in the tin plate mills of this district. Deliveries still are being promised six to seven weeks ahead. The price of $4.25 is the official quotation on tin plate, and tin mill black sheets are 2.50c, Pittsburgh. Long ternes are 2.90c, Pittsburgh. Considerable tin plate is being barged down the Ohio river to Cincinnati and other southern ports from Pittsburgh district mills.

An order for 10,000 tons of tin plate was placed here during the week. Orders for 2000 tons are fairly frequent.

Plates

Gas Line Will Take 10,000 Tons and Barges 1600 Tons—Prices Show Firmness

PLATE PRICES, PAGE 37

Pittsburgh — Approximately 800 tons of plates will be required for four double-bottom hopper-type Union Barge Lines barges, which Dravo Contracting Co. is about to build at Neville Island. Each of these barges will be 135 x 35 x 11 feet. Shell Petroleum Corp. has purchased tanks for Illinois, requiring 1600 tons of plates. Activity is still noticeable in light plates for beer barrels and other liquid containers and mills here have received some fair specifications recently for these accounts. Safety Guard & Mfg. Co., Pittsburgh, is low on 150 steel sill plates for the Pittsburgh federal engineers, bids being opened Aug. 15. The plate market is more definitely established at 1.60c, Pittsburgh, than in many months. Railroad buying still is absent although there are a few inquiries for plate girder spans in nearby districts.

Chicago—Plate shipments are fairly steady with new business showing no improvement. Additional brewery tank work is appearing with little business developing in the oil industry. Some additional welded pipe work is looked for, a recent award to the Milwaukee producer requiring 10,000 tons of plates. Municipal water tank projects are few. Plates nominally are 1.70c, Chicago.

Cleveland—Approximately 5000 tons of plates will be required for Cleveland watermains under the alternative bids accepted by the city last week; the estimated tonnage of cast pipe thereby is reduced to 18,000 tons. General contracts were awarded to five firms; material has not yet been purchased. For the Cleveland incinerator, on which bids are being tabulated, 300 tons of plates are pending. A considerable tonnage of plates for brewery tanks also is being negotiated. The Cleveland plate mill is maintaining operations at 50 per cent. On the small, miscellaneous orders placed recently 1.60c, base, Pittsburgh, is firm.

Boston—Plates continue most active of heavy steel products with prices firm at 1.70c, Coatesville, Pa. Mills are making prompt delivery on plain material, but are slightly delayed on flanged and machined plates in some instances. Additional volume has been placed for brewery and oil tanks and a barge while small-lot miscellaneous demand holds up well.

New York—Plate buying has declined but most platemakers have sufficient tonnage on books to keep production fairly steady over the remainder of the month. Some private ship work is in prospect, including a combination passenger and freight boat for the Gulf Pacific Mail Lines, requiring 3700 tons of plates, shapes and bars. Untra Mural Petroleum Co., Buenos Aires, Argentina, a subsidiary of the Texas Co., has placed 3400 tons of plates for tank work with McClintic Marshall Corp., Bethlehem, Pa.

Philadelphia—Plate shipments are being fairly well maintained, but apply mostly to orders placed before

the advance to 1.70c, Coatesville, Aug. 1. An inquiry involves 300 tons or tanks for a local brewery, on which Frank G. Stewart, Philadelphia, is general contractor, while an award involves 105 tons for a water tank for the Wilmington Suburban Water Co., Wilmington, Del. Railroad buying is featureless.

Plates may be required by Edward G. Budd Mfg. Co., Philadelphia, for a $142,550 contract for supplying six forward deck houses for the navy.

Contracts Placed

3400 tons, tank plates, Ultra Mural Petroleum Co., Buenos Aires, subsidiary of Texas Co., to McClintic-Marshall Corp., Bethlehem, Pa.

1600 tons, oil tanks, Wood River, Ill., for Shell Petroleum Corp., to Chicago Bridge & Iron Works, Chicago.

1000 tons, two submarines, navy yard, Portsmouth, N. H., 408 tons to Worth Steel Co., Claymont, Del., about 550 tons to Central Iron & Steel Co., Harrisburg, Pa., and Youngstown Sheet & Tube Co. Remainder, galvanized, to Enterprise Galvanizing Co., Philadelphia; bids Aug. 8, bureau of supplies and accounts, Washington.

800 tons, four covered hopper-type merchandise double-bottom barges for Union Barge Lines, Pittsburgh, to Dravo Contracting Co., Neville Island, Pittsburgh, each barge 135 x 35 x 11 feet.

710 tons, tunnel lining, metropolitan water bureau, Los Angeles; 500 tons to McClintic-Marshall Corp., Bethlehem, Pa.; 210 tons to Commercial Shearing & Stamping Co., Youngstown, O.

120 tons, 250,000-gallon elevated tank, Wilmington Suburban Water Co., Wilmington, Del., to Pittsburgh-Des Moines Steel Co., Pittsburgh, Pa.

Unstated tonnage, 100,000-gallon water tank, American Compress & Warehouse Co., Alexandria, La., and 75,000-gallon elevated water tank, Fernandina, Fla., to R. D. Cole Mfg. Co., Newman, Ga.

Contracts Pending

825 tons, including shapes, 231-foot motorship for Northland Transportation Co., Seattle; general contract to Lake Washington Shipyards, Seattle.

370 tons, tank for Grandview Park, city of Pittsburgh; bids Aug. 23.

300 tons, tanks for brewery, Philadelphia; bids asked through Frank G. Stewart, Philadelphia.

300 tons, tank, Columbia, S. C.; bids soon.

210 tons, bureau of supplies and accounts, navy, Washington, delivery Mare Island, Calif.; bids Aug. 29.

210 tons, schedule 517, Mare Island navy yard, Calif.; bids Aug. 29.

195 tons, schedule 494, Mare Island navy yard, Calif.; cold rolled sheet steel; bids Aug. 22.

180 tons, 14 gage black sheets for pipe line, Los Angeles; bids opened.

100 tons, tanks for Los Angeles; bids opened.

100 tons, 20 buoys, lighthouse bureau, Atlantic seaboard, Boston to Charlestown, S. C.; bids July 10, Staten Island, N. Y., all f.o.b.; five lighted whistle buoys, Biggs Boiler Works, Akron, O., $6575 low, but Bartlett-Hayward Co., Baltimore, to be recommended at $6830 due to lower delivery; three lighted gong buoys, Downington Iron Works Inc., Downington, Pa., $3936; six light buoys, Biggs Boiler Works, $4956; three lighted bell buoys, same fabricator, $1616; six light buoys, Union Boiler & Mfg. Co., Lebanon, Pa., $3600, and four lighted bell buoys, same fabricator, $2560.

Railroads

Repairs Bring Some Orders; Rail Buying in Prospect

Track Material Prices, Page 37

Track maintenance and car repairs bring to steel producers practically the only current orders for steel, and these are mainly in small lots. Some buying of rails is expected, the Chesapeake & Ohio being understood to be nearly ready to place 25,000 tons and the Union Pacific 5000 tons. Other rail buying is probable within 30 to 60 days. Track fastenings will accompany these rail orders. The Southern railway is inquiring for a moderate tonnage of spikes.

Rolling of 38,000 tons of rails and accessories for export to Brazil has been transferred to the Edgar Thomson mill of Carnegie Steel Co., Braddock, Pa., from the Ensley, Ala., works of the Tennessee Coal, Iron & Railroad Co. Production on this order is expected to start in September.

Prices for the remainder of this quarter are firm at 2.40c for large spikes and 1.90c for tie plates.

Rail Orders Placed

Hooker Electro Chemical Co., two 32-ton tank cars, to General American Tank Car Corp., Chicago.

E. I. du Pont de Nemours & Co. Inc., two narrow-gage tank cars, to General American Tank Car Co., Chicago.

Republic Steel Corp., 100 mine cars, to Irwin Foundry & Mine Car Co., Irwin, Pa.

Weyerhaeuser Timber Co., Tacoma, Wash., seventy-five 50-foot logging cars, special type, to Pacific Car & Foundry Co., Seattle.

Strip

Sales Made at New Prices; Shipments in Good Volume

Strip Prices, Page 37

Pittsburgh—Strip steel buying continues in fair proportions with firmer prices. Two full carloads of cold-rolled strip steel were booked here last week at 2.25c base, Pittsburgh, the significant fact being that the buyers in each case had bought at 1.90c and less previously. Hot-rolled strip is also firm at 1.65c, base, Pittsburgh, but unexpired balances at 1.60c, Pittsburgh, and less, are on books. Cooperage hoop holds at 1.75c, Pittsburgh.

Cleveland—Specifications for some leading producers this month are ahead of the tonnage in the comparable period in July. Some mills still are working on a portion of the tonnage booked in June. Shipments to the automotive industry are holding up fairly well. New sales are not as brisk as early in August. Cold rolled strip is firm at 2.25c, base, Cleveland; and hot-rolled, 1.65c, Pittsburgh.

Chicago—Despite a decline in new business strip shipments continue fairly heavy. A prospective decline in automobile production points to lighter demand for strip shortly, while some moderation also is noted in needs of miscellaneous consumers. Cold strip is quoted 2.25c, Pittsburgh-Cleveland, on new business but general coverage for the quarter at 1.80c previously defers a test until September. Hot strip generally is 1.75c, Chicago.

Boston—Most cold strip mills have four to five weeks business on the books for delivery during this quarter with operations still around 60 to 70 per cent of capacity. This will clean up low-priced contracts. Some new business for delivery by Sept. 30 has been done at 2.45c, Worcester, but little, if any, fourth quarter coverage has been done at any price.

Philadelphia—Few new orders are current in the strip market; shipments against contracts are holding up fairly well. Some producers are still behind on deliveries. The usual market on hot strip is 1.60c to 1.65c, Pittsburgh, or 1.91c to 1.96c, Philadelphia, and cold strip, 2.25c, Pittsburgh, or 2.56c, Philadelphia.

Cold-Finished Firm on Basis of Higher Price

Cold Finished Prices, Page 37

Pittsburgh — Cold-finished steel bars are firmly quoted at 1.95c, base, Pittsburgh, and unexpired balances of contracts placed some months ago at 1.70c are being billed at 1.95c. Advanced prices on turned and ground shafting are also in effect and although the market is easier from the standpoint of orders and shipments, prices are firmer.

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Triple Guard of FLAVOR

Mr. Bartlett Arkell, President of Beech-Nut Packing Co., discloses how they protect the famous flavor of Beech-Nut products

● "Distinctive flavor is the outstanding mark of Beech-Nut products—and we are scrupulously careful to guard it.

"The first requirement is *utmost cleanliness*. That's why constant vigilance surrounds every step of our manufacturing—from the preparation of raw materials straight through to the final packaging.

"Take Beech-Nut Sliced Bacon, for instance. In our slicing machines, every part that holds or touches the cured bacon is Monel Metal. Our bacon jar-washing machinery is of the same rust-proof, corrosion-proof metal.

"The fine flavor of Beech-Nut Bacon has had this protection for more than ten years.

"Monel Metal plays the same essential part in the manufacture of Beech-Nut Chili Sauce, Beech-Nut Catsup, Beech-Nut Tomato Juice, Beech-Nut Biscuits, Beech-Nut Beans and our many other products. Best grade of raw materials, exceptional care in each manufacturing process and cleanliness of machinery combine to produce Beech-Nut Quality Foods."

• • •

That explains why users of Beech-Nut products always find their favorite dish so unvaryingly delicious.

Monel Metal, in other industries, is used because of other qualities—because it cuts costs or speeds production. It is used in homes because of its spotless beauty. Its silvery sheen, cleanliness, great strength, toughness, corrosion-resistance and immunity to rust are ideal qualities for kitchen sinks and cabinet tops, table and range tops, hot water tanks and washing machines.

You find Monel Metal used in industry for food handling equipment of every kind, in hotels, restaurants and hospitals; in canneries and packing plants; for machinery of all sorts in laundries, chemical and power plants—in fact, most industries appreciate that no other metal has its unique combination of qualities.

The chances are that there are valuable but undiscovered uses for it in your own business. Drop us a line and let us tell you how others in your particular field have taken advantage of Monel Metal.

THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL STREET, NEW YORK, N. Y.

MONEL METAL

Monel Metal is a registered trade-mark applied to an alloy containing approximately two-thirds Nickel and one-third copper. Monel Metal is mined, smelted, refined, rolled and marketed solely by International Nickel.

Structural Shapes

Triboro, New York, Bridge Requiring 105,000 Tons Authorized—War Department to Take Bids On $60,000,000 Worth of Hangars and Barracks—Awards Higher

STRUCTURAL SHAPE PRICES, PAGE 37

New York—A loan has been authorized for the Triboro, New York, bridge, requiring 12,000 tons of steel for the towers, 75,000 tons for the superstructure, and 18,000 tons of steel floor plates if these are used, as contemplated, a total of 105,000 tons.

Some of the bridge steel for New York state included in the Aug. 11 bidding is being placed. Pittsburgh Testing Laboratories, Pittsburgh, will inspect the structural steel for the federal courthouse here, about 10,500 tons at 6.00c a ton. Plain material is 1.70c, eastern mill.

Pittsburgh—Structural contracts are slightly more numerous, but smaller individually. Pittsburgh Plate Glass Co. has awarded two buildings totaling 575 tons of shapes, one at Creighton, Pa., and one at Clarksburg, W. Va. Structural fabricated prices are showing more consistency, being based on a more uniform mill price on plain material. The asking price on structural shapes is 1.60c, base, Pittsburgh. Steel piling remains 1.90c, Pittsburgh, and wide flange shapes 1.70c, Pittsburgh.

Cleveland—Approximately 1000 tons of structural shapes were awarded here during the week, representing several projects. Fabricators are bidding on 600 tons for a Chrysler building at Detroit; and award of 700 tons for Erie railroad bridges at Elmira, N. Y., is expected shortly. Plain material is firm at 1.60c, base, Pittsburgh.

Chicago—A train shed for a local passenger railroad station will require 650 tons of shapes, while brewery additions here and at Ft. Wayne, Ind., require 875 tons. Small bridges are pending in several western states and bids are being asked on a number of small postoffices. Large tonnages still are lacking in new inquiries for public projects. Fifteen hundred tons have been placed for the Justice Park, Ill., bridge.

Philadelphia—Structural activity continues to lag, with 235 tons of shapes for a local brewery among the few outstanding inquiries. Considerable miscellaneous building of private character is believed to be held up pending the development of various trade codes.

The war department is issuing specifications for $60,000,000 worth of hangars and barracks. Federal aid of $2,000,000 is expected to stimulate demand for steel piling in New Jersey.

Boston—Little Bay bridge superstructure, Dover, N. H., closing this week, 1800 tons, is the largest active structural project in this territory. Plain material is 1.70c, eastern mill.

Buffalo—New demand for structural steel has declined, but activity still is unusually good for this season. Current bookings in the past week in this district exceeded 500 tons.

Contracts Placed

1800 tons, building, National Biscuit Co., New York, to American Bridge Co., Pittsburgh.

1500 tons, bridge, Justice Park, Ill., to American Bridge Co., Pittsburgh.

600 tons, extension to plant, Rome, Ga., for Tubize-Chatillon Corp., to Virginia Bridge & Iron Co., Roanoke, Va.

570 tons, bridge, Central railroad of New Jersey, Newark, N. J., to Phoenix Bridge Co., Phoenixville, Pa.

440 tons, state bridge, Saugerties village, Ulster county, New York, to Lackawanna Steel Construction Corp., Buffalo; Harrington Engineering Co., New York, general contractor.

400 tons, state bridge, route 1, Roanoke river, Mecklenburg county, Virginia, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

395 tons, highways, Michigan, to R. C. Mahon Co., Detroit.

350 tons, garage, West Eighty-seventh street, Manhattan (New York) to George A. Just Co., Long Island City, N. Y.; through Caye Construction Co.

350 tons, postoffice, Monida, Mont., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

330 tons, bridge, department of agriculture, Humphrey, Idaho, to Pittsburgh-Des Moines Steel Co., Des Moines.

322 tons, highway work in Clark county, Utah, for United States bureau of public roads, to unnamed interest.

300 tons, building, Clarksburg, W. Va., for Pittsburgh Plate Glass Co., Pittsburgh, to Pittsburgh Bridge & Iron Works, Rochester, Pa.

275 tons, building, Creighton, Pa., for Pittsburgh Plate Glass Co. to McClintic-Marshall Corp., Bethlehem, Pa.

255 tons, two submarines, navy yard, Portsmouth, N. H., 160 to John T. Hill, Baltimore. Carnegie Steel Co., Pittsburgh, took 70 tons, and Bethlehem Steel Co. the remainder.

250 tons, mercantile building, Hutchinson, Kans., to Kansas City Structural Steel Co., Kansas City, Mo.

230 tons, floor reinforcing, Cleveland public schools, to various fabricators.

210 tons, bridges, Lackawanna, N. Y., to McClintic-Marshall Corp., Bethlehem, Pa.

165 tons, bridge, Harford county, Maryland, to McClintic-Marshall Corp., Bethlehem, Pa.; through Frank C. Arozzo & Son, Baltimore. Seventy tons of concrete bars to Concrete Steel Co.

150 tons, addition, high school, Cumberland, Md., to Guibert Steel Co., Pittsburgh; James C. Powell, Cumberland, general contractor. Kalman Steel Corp., Bethlehem, Pa., awarded 50 tons reinforcing bars.

150 tons, plant for American Brakeshoe & Foundry Co., South San Francisco, Calif., to Judson-Pacific Co., San Francisco.

125 tons, state bridge, Dan river, Halifax county, Virginia, to Virginia Bridge & Iron Co., Roanoke, Va.; F. M. Arthur, South Boston, Va., general contractor.

125 tons, addition to plant of National Paper Products Co., Port Townsend, Wash., and two pontoons for Fairbanks, Alaska, to Pacific Car & Foundry Co., Seattle.

120 tons, bridge, Newark, O., to International Stacey Corp., Columbus, O.

114 tons, piling, Fairchild Milling Co., Cleveland, to Carnegie Steel Co., Pittsburgh.

100 tons, stand for Longacres race track, Seattle, to Steel Fabricators Inc., Seattle.

Unstated tonnage, steel supports, bridge, Hickahala canal, Senatobia, Miss., to Pidgeon-Thomas Iron Co., Memphis, Tenn.

Shape Awards Compared

	Tons
Week ended Aug. 19	9,296
Week ended Aug. 12	7,668
Week ended Aug. 5	5,882
This week in 1932	15,715
Weekly average, 1932	14,285
Weekly average, 1933	14,675
Weekly average, July	15,809
Total to date, 1932	527,770
*Total to date, 1933	498,955

*Revised.

Contracts Pending

105,000 tons, Triboro bridge, authorized; 12,000 tons for towers, 75,000 tons for superstructure, and 18,000 tons if a steel plate floor is installed as contemplated.

1500 tons, John Marshall high school, Rochester, N. Y.

1200 tons, including 750 tons plates, four drum gates, pier plates and fittings, Madden Dam, Panama Canal; Virginia Bridge & Iron Co., Roanoke, Va., low, $137,800. Lake Erie Engineering Corp., Buffalo, low on two 84-inch internal differential needle valves at $26,844. Bids Aug. 15, schedule 2885.

672 tons, Broadway tunnel, Oakland, Calif.; plans completed.

650 tons, train shed, LaSalle street station, Chicago.
475 tons, building, Atlas Brewing Co., Chicago.
425 tons, New York state bridge work, Eagle Bridge, N. Y.
400 tons, state bridges, New York; bids Sept. 1.
400 tons, Berghoff Brewing Co., Ft. Wayne, Ind.
380 tons, New York state bridge work, Fallsburg, N. Y.
300 tons, warehouse, Commercial Solvents Co., Terre Haute, Ind.
300 tons, highway bridges, Oklahoma.
235 tons, brewery, Philadelphia; Frank G. Stewart, that city, general contractor; 300 tons plates also required for tanks.
200 tons, highway bridges, Colorado.
200 tons, highway bridges, Indiana.
200 tons, highway bridges, Texas.
139 tons, bridge material, Los Angeles; bids Aug. 14
100 tons, P street bridge, over Rock creek, Washington; bids Aug. 30.

Concrete Bars

Awards for Week Improve—Increasing Volume of Highway Work Up in New York—Jobbers' and Mill Stocks Heavier — Efforts Renewed at Price Stabilization

REINFORCING BAR PRICES, PAGE 37

Pittsburgh—Demand for new billet steel bars and rail steel bars for reinforcing purposes continues quiet. Prices hold at 1.75c, Pittsburgh, on cut lengths of new billet steel, and 1.50c, Pittsburgh, on rail steel. Producers are not willing to quote these prices for projects with closing dates beyond the end of September. A survey of stocks of bars in jobbers' hands indicates that this tonnage has been running heavier than usual. The same condition obtains in mill stocks where new billet steel has been stocked in some volume.

Cleveland—Concrete bar producers are endeavoring to stabilize their prices, though little tonnage is pending. The Cleveland maker holds to 1.65c, base, Cleveland, and 1.60c, Pittsburgh, for new billet steel in mill lengths, the same base prices as for commercial steel bars. Though one billion dollars of the federal governments public construction program have been allocated, including $400,000,000 for road work, such projects are slow in developing. A state letting scheduled for Aug. 25 requires approximately 150 tons.

Chicago—Reinforcing bar inquiries for private projects are increasing slowly but only small lots usually are required. A grain elevator here will take 300 tons, while 155 tons have been placed for a bridge at Justice Park, Ill. Few inquiries are appearing for public works except for a number of small post offices. Bar prices generally are steady at 1.75c for billet bars, and 1.50c for rail steel.

Boston—Concrete reinforcing bar demand is light; with buying confined to scattered small lots. Except for a Boston city hospital building, taking several hundred tons, bridges and highways offer the most promising outlet. Cut lengths at 1.75c, Buffalo and Pittsburgh, are untested.

Philadelphia—Award of 850 tons for the Pennsylvania railroad tunnel in Baltimore to the Concrete Steel Co. is outstanding in reinforcing bars. Inquiry is negligible, and prices are still unsettled.

New York—Except for highways and bridges requiring an increasing volume of mesh and concrete bars, demand is light. Contractors bids on this type of work reflect but slightly higher material costs. Billet steel cut length bars on the small volume being bought are fairly firm at 1.75c, Pittsburgh.

Contracts Placed

1108 tons, specification 3173, Los Angeles, to Concrete Engineering Co., Los Angeles.
850 tons, Pennsylvania railroad tunnel, Baltimore, awarded through Arundle Corp., Washington, general contractor, to Concrete Steel Co., Philadelphia.
800 tons, addition, Rahr Malting Co., Manitowoc, Wis., to Laclede Steel Co., St. Louis.
318 tons, tie plates for Alaska railroad, to Pacific Coast Steel Corp., Seattle.
177 tons, specification A-3268-A, Boulder dam, to Colorado Fuel & Iron Co., Denver.
155 tons, Justice Park, Ill., bridge, substructure to Truscon Steel Co., Youngstown, O.
150 tons, power plant, United States veterans hospital, Milwaukee, to R. L. Gilbertson, Milwaukee.
150 tons, mesh, highway, Newburgh-Woodbury, N. Y. to American Steel & Wire Co. New York; through Curtis & Harper Inc., Newburgh.

Concrete Awards Compared

	Tons
Week ended Aug. 19	3,708
Week ended Aug. 12	390
Week ended Aug. 5	1,700
This week, 1932	3,213
Weekly average, 1932	3,920
Weekly average, 1933	3,246
Weekly average, July	5,282
Total to date, 1932	140,897
Total to date, 1933	110,369

Contracts Pending

1000 tons, White Point outfall sewers, Los Angeles; plans completed.
300 tons, grain elevator, Chicago.
250 tons, addition to Marine hospital, Buffalo; bids Aug. 24.
130 tons, bridges, Jones Beach, New York; bids Aug. 22.
125 tons, bridge No. 5, Main street, Carnegie, Pa.; bids by Allegheny county, Pennsylvania department of highways, bridges and tunnels, Aug. 29.

Bolt, Nut Buying Steady; Prices Holding Firmly

Bolt, Nut, Rivet Prices, Page 37

Bolt, nut and rivet orders have not diminished in number but total tonnage so far in August is below July. However, the market has seen heavier buying recently than the last week of July. Absence of large orders is especially noted. Prices continue at 73 off list for bolts and nuts, 2.50c, Pittsburgh, and 2.60c, Chicago for large rivets, applying through third quarter. No fourth quarter inquiry has appeared and producers have not signified their idea of price for that delivery.

Railroad orders are somewhat better, though still light, automotive needs are less than early in the month.

National Screw & Mfg. Co., Cleveland, has been awarded most of the bolts and nuts bought by the navy, at $12,381.74, delivered various yards, under the opening of July 25. The remainder went to the Erie Bolt & Nut Co., Erie, Pa., at $1448.73.

Semifinished Slower

Semifinished Prices, Page 38

Shipments of sheet bars to tin plate mills continue heavy, but in other directions the movement of semifinished steel is slower. A cargo of 1100 tons of billets from the Pittsburgh district was picked up by the Ford Motor Co.'s barge LAKE FREELAND at Conneaut, O., for delivery to Detroit last week. Sheet bars, billets and slabs hold at $26, base, Pittsburgh, Youngstown and Cleveland; wire rods at $35, and forging billets $31.

Pipe

Tonnage Improves on Some Substantial Awards for Gas Lines—7000 Tons for Kansas

PIPE PRICES, PAGE 37

Pittsburgh—Owing partly to overbuying by some jobbers, the market for pipe is moving at a considerably slower pace than two to three weeks ago. An improvement is anticipated for welded pipe in the next few months, but line pipe is inactive. Republic Steel Corp. booked 1500 tons of line pipe for a 195-mile line in the Southwest for which the A. O. Smith Corp. has contracted to supply 20 miles of feeder lines. The buyer was the Western Gas Co., El Paso, Tex.

Cleveland—Five thousand tons of steel pipe and 18,000 tons of cast iron pipe will be required for Cleveland watermains under general contracts awarded last week to five contractors. These contractors now are negotiating for the material. The tonnage of cast pipe was reduced from that originally expected by an increase in the amount of steel pipe that was awarded under the alternative bids. The general market for pipe is quiet, with prices steady.

Chicago—Only a few cast pipe inquiries are appearing, the largest in this district being for 1500 tons of 8 to 30-inch pipe for Eau Claire, Wis. Delay still is encountered in the approval of applications for federal funds and proposed work in some instances is expected to be deferred. A 48-mile gas pipe line to be laid in Kansas has been placed with an Ohio producer. The line involves 7000 tons of 18-inch welded pipe.

The Minnesota Northern Natural Gas Co. is to build a 65-mile extension from Owatonna, Minn., to St. Paul.

Birmingham, Ala.—Pipe projects under consideration are numerous, with a large tonnage involved. Orders, however, are slow.

New York—Cast pipe buying and inquiry is sluggish. Public Service Corp. of New Jersey placed 1440 feet, 16-inch with R. D. Wood & Co. Shading on comparatively small tonnages has not disappeared, although $35 to $36, eastern foundry, is listed.

Boston—While several sizable projects taking cast pipe are in the planning stage, immediate bidding is not likely, purchasing depending on financing. Most orders are for small lots on which prices are generally firm.

Cast Pipe Placed

197 tons, 3 to 12-inch, Kings Park hospital, New York, to Warren Foundry & Pipe Co., Phillipsburg, N. J.; also 21 tons of fittings.

Steel Pipe Placed

7000 tons, 18-inch, electric welded pipe for Kansas gas line to Youngstown Sheet & Tube Co., Youngstown, O.

Cast Pipe Pending

18,000 tons, watermains, Cleveland; project also includes 5000 tons of steel pipe. General contracts to Joseph Winterbottom Co., Cogito Construction Co., Curro & Whitaker Co., Lowensohn Construction Co., and Carroccio & Guardio, Cleveland.

1850 to 2150 tons, 4 to 8-inch class B or 150, Oakland, Calif.; bids opened.

1500 tons, 8 to 30-inch, class C, Eau Claire, Wis.

400 tons, 18 and 20-inch, sewers, Westchester county, New York; general contract bids rejected, to readvertise. Contract taking 512 feet, 18-inch to be awarded.

250 tons, 10 and 18-inch for McNeil Island penitentiary, Washington; bids in.

210 tons, 6 to 12-inch class 150, Fair Grounds at Pomona, Calif., for Los Angeles county; bids opened.

198 tons, 10 and 16-inch class 150, Ventura, Calif.; bids soon. Alternate bids on steel and concrete pipe.

120 tons, 6 and 8-inch, Stanley, Va.; taking bids, also 75,000-gallon elevated steel tank.

100 tons, 10 and 12-inch, state project, Ossining, N. Y.

100 tons, cast iron water pipe specials, Washington; Lynchburg Foundry Co., Lynchburg, Va., low, $63.50 a ton. Bids Aug. 10.

Steel Pipe Pending

5000 tons, watermains, Cleveland; project also includes 18,000 tons of cast iron pipe. General contracts to Joseph Winterbottom Co., Cogito Construction Co., Curro & Whitaker Co., Lowensohn Construction Co., and Carroccio & Guardio, Cleveland.

Moline Iron Works, Moline, Ill., has re-elected officers and directors as follows: L. E. Nutt, president; M. C. Nutt, vice president and secretary; B. V. Nutt, vice president; John T. Miles, treasurer. Directors are: William Butterworth, Sol Hirsch, John T. Miles, B. V. Nutt, M. C. Nutt, L. E. Nutt and C. R. Rosborough.

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Coke

Prices Drop as Mines Resume; Shipments Hold High Rate

Coke Prices, Page 38

With the resumption of more mines in the Western Pennsylvania district the market on beehive coke has seen withdrawal of several high asking prices. Furnace coke has settled to not more than $2.50, Connellsville ovens, and contrasts with an asking price of $4, ovens. Common grades of foundry coke have declined and are not more than $2.75 to $3, same basis. On the other hand the advance of 50 cents a ton in premium foundry coke is holding, making the market on that grade $4.50. Clairton by-product coke holds at $3.

Shipments of by-product foundry coke at Chicago are about equal to the July rate. The July movement was fairly heavy in anticipation of price advances. Books remain closed on September delivery at Chicago, with prices yet to be announced. The current market is $7.50, ovens, for outside delivery and $8.25. delivered Chicago. The delivered price for foundry coke has been advanced to $8.25 in the St. Louis switching district for August delivery.

Employment, Payrolls Show Increase for July

Washington — July employment index number for the iron and steel industry was 67.6 compared with 59.4 for June and 51.7 for July of last year, taking 1926 at 100, according to the bureau of labor statistics. The July payroll index was 42.8 compared with 35.9 for June and 19.7 for July of last year.

Machine tool July employment index was 33.3 compared with 31.2 for June and 30.7 for July of last year while the July payroll index was 22 compared with 20.2 for June and 17.8 for July of last year.

For iron and steel and their products, not including machinery, the July employment index was 64.9 compared with 58.5 for June and 51.6 for July of last year while the July payroll index was 41.1 compared with 36 for June and 23.1 for July of last year.

Imports at Philadelphia

Philadelphia—Imports received at this port during the week ending Aug. 12 included 150 tons iron ore, Germany; 4500 tons chrome ore, Turkey; 6024 tons pig iron, Netherlands and 2035 tons pig iron, British India.

Wholesale Price Index for Steel Is Shade Higher

Washington—July wholesale price index number for iron and steel was 77.7 compared with 76.2 for June and 77.2 for July of last year, taking 1926 at 100, according to the bureau of labor statistics.

Structural steel wholesale price index was 81.7 for July, for June of this year and also for July of last year while the July index for agricultural implements was 83 compared with the same or June and 84.9 for July of last year.

For all metals and metal products the July wholesale price index number was 80.6 compared with 79.3 for June and 79.2 for July of last year.

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Pig Iron

Shipments Increase as Foundries Specify Heavily on Contracts—Prices Continue Strong

PIG IRON PRICES, PAGE 38

Pittsburgh—Despite settlement of the coal strike, which threatened to force certain users of basic iron into inquiring from outside sources, the market now features possible buying of basic by two nonintegrated mills here, which normally seek requirements about this time. A down-river mill is having a blast furnace repaired and has dropped its intention of buying basic from an outside source. Merchant trade is confined to small less-carload sales which are taking the full quoted schedule. This is firmly named at $17 on foundry grades, $17.50 on bessemer and $16.50 on basic, all Neville Island furnace base. Operation of merchant stacks in this district is unchanged.

Cleveland—Shipments continue to increase; for a leading lake merchant interest they will be approximately 35 per cent heavier in August than last month. These shipments are mainly on contracts booked at prices below the present levels, and consumers evidently are stocking up. Prospect of further price advances, with the spread of industrial codes, coupled with the fact makers are not quoting beyond Sept. 30, also that railroad service is not as prompt as formerly, are reasons assigned for the movement of iron. Spot sales are lighter. The market is firm at $16.50, base, Cleveland furnace, for local and outside shipments. Makers of Jackson county silvery and bessemer ferrosilicon irons have advanced prices $1 to $1.50 per ton.

Chicago—Quietness in new buying is in contrast to shipments which are the heaviest so far this year. For some interests the movement is 35 per cent ahead of the rate a month ago. While consumption is well maintained and further gains are noted in operations of some foundries, the upturn in shipments is accounted for to a large extent by the desire of consumers to take in material under contract. There is some fear that unshipped tonnage on Sept. 30 may be canceled under provisions of the iron and steel code and higher prices for fourth quarter are regarded as not unlikely. The market is well maintained at $17, furnace, for No. 2 foundry and malleable.

Boston—New buying is light, but several fair inquiries are out and delivered prices for the leading domestic sellers in New England are more clarified with Everett, Mass., as a basing point. While Dutch iron is reported $1 higher, shipping point, it is still below domestic prices in Connecticut at least. No. 2 foundry iron is firm at $17, Everett furnace, with Buffalo sellers in line.

New York—Purchase of 2000 tons of foundry iron by a consumer in this district for delivery this quarter leads in an otherwise dull market. One Buffalo producer reports better releases against contracts than last month, and in general deliveries are well maintained, but fresh buying is light. Prices are firm, with some sellers of the opinion now that they will not open books for fourth quarter much before Sept. 10.

Philadelphia—One eastern producer reports shipments so far this month as being at a higher rate than in July, when the tonnage moved was the largest for any one month since 1929. Shipments this month appear in general fairly well maintained; orders, however, have shown a decline. Prices are firm, with sellers showing a disposition to hold off on fourth quarter quotations until they can better appraise their costs for that period. Recent arrival of 6000 tons of Royal Dutch iron is understood to be applied largely against old contracts.

Buffalo—Shipments are fully up to merchant production in the district. Lack of fourth quarter prices has forced a discontinuance of buying and little new tonnage is being entered as consumers are well covered for this quarter. Six furnaces continue in blast here.

Cincinnati—Buying reflects an intermission between heavy coverage at lower prices and fixing of quotations for the fourth quarter, with clarification of industrial codes. Shipments against contracts are the heaviest this year. Louisville & Nashville railroad is inquiring for 745 tons of iron in various analyses.

St. Louis—Melters being covered on third quarter needs and furnace interests not having opened books for fourth quarter, new buying has

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slackened. Prices are firm. August shipments probably will exceed those of any month since 1930. Farm implement manufacturers are planning to resume operations, mainly for building up stock.

Birmingham, Ala.—Small-lot sales continue; base price, $13, remains firm and deliveries are good. Eight blast furnaces are in operation in the district, six on foundry iron and the two larger furnaces of Tennessee Coal, Iron & Railroad Co. on basic. No business is reported booked as yet for fourth quarter delivery but prospects are bright.

August Iron Ore Shipments At 4,300,000-ton Rate

Iron Ore Prices, Page 38

Cleveland—Shipments of Lake Superior iron ore so far in August are at the rate of 4,300,000 tons for the month, compared with 3,430,785 tons shipped in July. The movement to Sept. 1 will be approximately 10,000,000 tons; the total for the season is estimated at 20,000,000 tons.

Consumption continued to increase in July, and stocks of ore at lower lake ports and furnaces now are 4,287,326 tons less than a year ago, as shown by the following report from the Lake Superior Iron Ore association:

	Tons
Consumed in June	1,894,004
Consumed in July	2,626,293
Increase in July	732,289
Consumed in July, 1932	644,732
On hand at furnaces Aug. 1, 1933	22,979,543
On Lake Erie docks Aug. 1, 1933	4,792,192
Total at furnaces and Lake Erie docks Aug. 1, 1933	27,771,735
Total Aug. 1, 1932	32,059,061

Continued improvement in the Lake Superior iron ore trade is reflected in an increase of 69 active vessels from July 15 to Aug. 15. On the latter date 185 were carrying ore. The number a year ago was 17.

Pittsburgh Steamship Co., subsidiary of the United Stataes Steel Corp., has 71 vessels in the ore trade; Interlake Steamship Co., subsidiary of Pickands, Mather & Co., and the Cleveland-Cliffs Iron Co., each 21; M. A. Hanna Co., as agents, and Hutchinson & Co., each ten; and Bethlehem Transportation Corp., nine. The remaining number was distributed among 12 transportation companies.

The fleet of American bulk cargo carriers comprises 330, of which 217 were in commission Aug. 15.

New York—The Port Colbourne, Ont., consumer is receiving six cargoes of North African low phosphorus iron ore. Three of these cargoes have been received within the past few weeks, while a fourth is expected soon to arrive. The two remaining cargoes are scheduled to be received by Oct. 1. In addition a partial cargo of Russian manganese ore is said to be on order for Port Colbourne.

Ferroalloys Firm

Ferroalloy Prices, Page 38

Ferromanganese specifications are down slightly, in line with steelmaking operations. Prices are firm at $82, eastern seaboard, on spot and contract shipments for this quarter. Domestic spiegeleisen, 19 to 21 per cent, is steady at $27, furnace, for spot.

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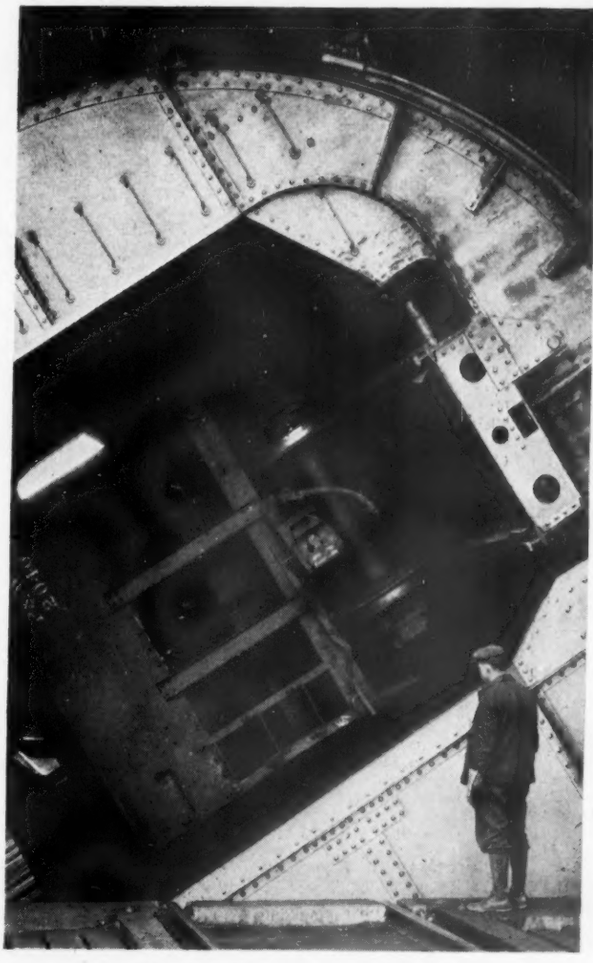

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Scrap

Quiet Prevails with Little Buying — Prices Adjusting to Higher Level on Some Grades

Pittsburgh—The market showed a quieter but not noticeably easier tone last week. Trading subsided to within the levels of a few weeks ago, when the last important mill buying was done. Subsequently, however, there have been purchases by mills here of select railroad scrap at above the $13.50 to $14 quoted market. It is understood, however, that this scrap carries a recognized premium, thus making the top of the strict No. 1 heavy melting steel market here no more than $14. A sale of couplers and knuckles, springs and steel car wheels was made to a large district foundry at $15.75 last week, establishing a market 25 cents higher. Machine shop turnings were sold to a district mill at $11. Blast furnace scrap is in quiet demand. The Duquesne, Pa.,

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	9.50 to 11.00
Boston, dealers	7.50 to 7.75
Buffalo, No. 1	11.00 to 11.50
Buffalo, No. 2	10.00 to 10.50
Chicago	10.00 to 10.50
Cleve., No. 1	10.50 to 11.00
Cleve., No. 2	10.00 to 10.50
Det., No. 1	9.50 to 10.00
Det., No. 2	8.50 to 9.00
E. Pa.	12.00
E. Pa., No. 2	10.50
Federal, Ill.	8.75 to 9.25
Granite City, Ill.	8.25 to 8.75
N. Y., deal. lt. lt.	8.00 to 8.50
N. Y., deal. No. 2	7.00 to 7.50
N. Y. deal. yd.	5.50 to 6.00
Pitts., No. 1	13.50 to 14.00
St. L. No. 1 del.	9.75 to 10.25
Valleys, No. 1	13.00 to 13.50

COMPRESSED SHEETS

Buffalo, dealers	9.50 to 10.50
Chi. (Factory)	8.50 to 9.00
Cleveland	10.00 to 10.50
Detroit	9.50 to 10.00
E. Pa. new mat.	11.00 to 11.50
Pittsburgh	13.00 to 13.50
Valleys	12.50 to 13.00

BUNDLED SHEETS

Buffalo	5.50 to 6.00
Cincinnati, del.	6.00 to 6.50
Cleveland	8.00 to 8.50
Eastern Pa.	9.00 to 10.00
Pittsburgh	12.00 to 12.50
St. Louis	6.00 to 6.50

SHEET CLIPPINGS LOOSE

Chicago	5.00 to 5.50
Cincinnati	5.00 to 5.50
Detroit	6.50 to 7.00
St. Louis	5.50 to 6.00

STEEL RAILS SHORT

Birmingham	11.50 to 12.00
Boston, dealers	7.00 to 7.25
Buffalo	12.00 to 12.50
Chicago (3 ft.)	11.50 to 12.00
Chicago (2 ft.)	12.00 to 12.50
Cincinnati, del.	12.00 to 12.50
Detroit	11.00 to 11.50
Pitts. (open-hearth, 3 ft. and less)	15.00 to 15.50
St. Louis	11.50 to 12.00

STOVE PLATE

Birmingham	7.50 to 8.00
Boston, dealers	4.50 to 4.75
Buffalo	9.00 to 9.50
Chicago, net	7.50 to 8.00
Cinci., deal.	7.00 to 7.50
Detroit, net	4.50 to 5.00
Eastern Pa.	9.50
N. Y. deal. Fdry.	6.00 to 6.50
St. Louis	7.00 to 7.50

COUPLERS, SPRINGS

Buffalo	11.50 to 12.00
Chicago	11.00 to 11.50
Eastern Pa.	14.00 to 14.50
Pittsburgh	15.25 to 15.75
St. Louis	10.00 to 10.50

ANGLE BARS—STEEL

Chicago	11.00 to 11.50
St. Louis	10.00 to 10.50

LOW PHOSPHORUS

Buffalo, billets and bloom crops	11.50 to 12.50
Cleveland bil. and bloom crops	12.50 to 13.50
Eastern Pa.	13.00 to 14.00
Pittsburgh billet bloom crops	16.50 to 17.00
Pitts., sheet bar crops	16.00 to 16.50

FROGS, SWITCHES

Chicago	10.50 to 11.00
St. Louis	10.00 to 10.50

SHOVELING STEEL

Chicago	10.00 to 10.50
Cleveland	6.75 to 7.00
St. Louis	9.00 to 9.50

RAILROAD WROUGHT

Birmingham	7.00 to 7.50
Boston, dealers	2.00 to 2.50
Buffalo, No. 1	7.00 to 8.00
Buffalo, No. 2	11.00 to 11.50
Chi., No. 1, net	8.00 to 8.50
Chi., No. 2	10.25 to 10.75
Cinci., No. 2	9.50 to 10.00
Eastern Pa.	13.00
N. Y., No. 1 deal.	8.00 to 8.50
Pitts., No. 1	13.50 to 14.00
St. Louis, No. 1	7.00 to 7.50
St. Louis, No. 2	8.75 to 9.25

SPECIFICATION PIPE

Boston	4.00 to 4.50
Eastern Pa.	9.50 to 10.00
N. Y., deal.	5.50 to 6.00

BUSHELING

Buffalo, No. 1	9.50 to 10.50
Chicago, No. 1	8.50 to 9.00
Cinci., No. 1 deal.	7.00 to 7.50
Cinci., No. 2	3.50 to 4.00
Cleve., No. 2	8.00 to 8.25
Det., No. 1 new	8.25 to 8.75
St. Louis, No. 1	6.50 to 7.00
Val. new No. 1	12.50 to 13.00

MACHINE TURNINGS

Birmingham	3.50 to 4.50
Boston, dealers	4.25 to 4.50
Buffalo	6.25 to 6.75
Chicago	5.50 to 6.00
Cinci., deal.	5.50 to 6.00
Cleveland	8.00 to 8.25
Detroit	6.50 to 7.00
Eastern Pa.	8.00 to 8.50
N. Y., deal.	4.50 to 5.00
Pittsburgh	10.50 to 11.00
St. Louis	4.50 to 5.00
Valleys	10.75 to 11.00

BORINGS AND TURNINGS
For Blast Furnace Use

Boston, dealers	3.50 to 3.75
Buffalo	6.50 to 7.00
Cinci., deal.	5.50 to 6.00
Cleveland	8.25 to 8.50
Detroit	7.00 to 7.50
Eastern Pa.	7.00 to 7.50
N. Y., deal.	4.50 to 5.00
Pittsburgh	9.75 to 10.25

CAST IRON BORINGS

Birming., plain	3.50 to 4.50
Boston, chem.	10.00 to 11.00
Boston, dealers	3.25 to 3.50
Buffalo	6.25 to 6.75
Chicago	6.00 to 6.50
Cinci., deal.	5.50 to 6.00
Cleveland	8.25 to 8.50
Detroit	7.00 to 7.50
E. Pa., chem.	12.00 to 15.00
N. Y., deal.	4.50 to 5.00
Pittsburgh	9.75 to 10.25
St. Louis	4.75 to 5.25

PIPE AND FLUES

Cinci., deal.	4.50 to 5.00

RAILROAD GRATE BARS

Buffalo	5.00 to 5.50
Chicago, net	7.00 to 7.50
Cincinnati	5.00 to 5.50
Eastern Pa.	9.00 to 9.50
N. Y., deal.	5.25 to 5.50
St. Louis	6.00 to 6.50

FORGE FLASHINGS

Boston, dealers	5.00 to 5.50
Buffalo	9.00 to 9.50
Cleve. ov. 10 in.	9.00 to 9.50
Detroit	8.00 to 8.50

FORGE SCRAP

Boston, dealers	4.00 to 4.50
Chicago (heavy)	11.50 to 12.00
Eastern Pa.	10.50

ARCH BARS, TRANSOMS

Chicago, net	8.00 to 8.50
St. Louis	9.50 to 10.00

AXLE TURNINGS

Boston, dealers	4.50 to 4.75
Buffalo	7.50 to 8.00
Chi., elec. fce.	8.00 to 8.50
Cleveland	9.50 to 10.00
Eastern Pa.	10.00 to 10.50
St. Louis	5.50 to 6.00

STEEL CAR AXLES

Birmingham	9.50 to 11.00
Boston, ship. pt.	8.00 to 8.50
Buffalo	10.00 to 11.00
Chicago, net	11.50 to 12.00
Eastern Pa.	15.50
St. Louis	10.25 to 10.75

SHAFTING

Boston, ship. pt.	10.00 to 10.25
Eastern Pa.	15.00 to 15.50
N. Y., deal.	10.00 to 10.25
St. Louis	8.00 to 8.50

CAR WHEELS

Birming., iron	9.00 to 9.50
Boston, iron deal.	6.75 to 7.25
Buffalo, iron	8.00 to 9.00
Buffalo, steel	11.00 to 11.50
Chicago, iron	9.50 to 10.00
Chi., rolled steel	11.50 to 12.00
Cincinnati, iron	9.00 to 9.50
E. Pa., iron	12.00 to 13.00
E. Pa., steel	14.50
Pitts., iron	12.75 to 13.25
Pitts., steel	15.25 to 15.75
St. Louis, iron	8.50 to 9.00
St. Louis, steel	10.00 to 10.50

NO. 1 CAST SCRAP

Birmingham	9.50 to 11.00
Boston, No. 2	5.00 to 5.50
Boston, Tex. con.	10.75 to 11.00
Buffalo, cupola	10.00 to 10.50
Buffalo (mach.)	11.00 to 11.50
Cleve. cupola	10.50 to 11.00
Chi., mach. net	10.00 to 10.50
Chi., railroad net	9.50 to 10.00
Cinci., mach. cup.	9.00 to 9.50
Cleve. cupola	10.00 to 10.50
Detroit, net	8.50 to 9.00
E. Pa., cupola	12.00 to 13.00
N. Y., cup. deal.	6.00 to 6.50
N. Y., del. local foundries	9.00 to 9.50
Pitts., cupola	10.50 to 11.00
San Fran., del.	13.50 to 14.00
Seattle	4.50 to 6.50
St. Louis, No. 1	9.00 to 9.50
St. L. No. 1 mach.	9.00 to 9.50

HEAVY CAST

Boston, del.	5.50 to 5.75
Buffalo, break	7.00 to 8.00
Cleve., break	7.50 to 8.00
Detroit, auto net	9.50 to 10.00
Detroit, break.	6.50 to 7.00
Eastern Pa.	10.00 to 10.50
N. Y., No. 1, deal.	7.00 to 7.50
N. Y., break. deal.	6.75 to 7.00
Pittsburgh	10.00 to 10.50

MALLEABLE

Boston, consum.	12.50 to 13.00
Buffalo	11.50 to 12.00
Chicago, R. R.	10.50 to 11.00
Cinci., agri. del.	8.75 to 9.25
Cinci., R. R. del.	9.25 to 9.75
Cleveland, rail	11.50 to 12.00
Detroit, auto	8.50 to 9.00
St. Louis, R. R.	9.50 to 10.00

RAILS FOR ROLLING
5 feet and over

Birmingham	9.50 to 11.00
Boston, dealers	6.75 to 7.25
Buffalo	9.00 to 9.50
Chicago	11.00 to 11.50
Eastern Pa.	13.00
New York, dealer	8.00 to 8.25
St. Louis	10.50 to 11.00

LOCOMOTIVE TIRES

Chicago, cut	11.00 to 11.50
St. L., No. 1	8.50 to 9.00

LOW PHOS. PUNCHINGS

Buffalo	11.00 to 11.50
Chicago	11.50 to 12.00
Eastern Pa.	12.50 to 13.50
Pittsburgh	15.50 to 16.00

scrap yard of Carnegie Steel Co. and the Greenville Steel Car Co. are actively engaged in scrapping about 2500 40-ton steel cars of the Bessemer & Lake Erie railroad.

Cleveland—With dealers and melters not inclined to activity the market for steel and iron scrap is without definite trend and a variety of opinions is held as to the future. Some heavy steel is moving to Youngstown under restrictions.

Chicago—Scrap prices are easier, affected by lack of new buying and by moderate increase in available material. While previous sales of heavy melting steel were made at $10.75 dealers are able to pick up this grade at $10 and some distress tonnage is reported to have gone at this figure. Consumers hesitate to place new orders though shipments against contracts are nearing completion and stocks on hand are not excessive, based on current operations. Several railroad grades are quoted 25 to 50 cents a ton below recent levels.

Boston—Scrap prices are strong and the upward tendency for some grades continues, notably No. 1 machinery cast, breakable cast, machine shop and chemical borings and heavy melting steel. For the latter grade $7.75, shipping point, has been paid, with reports of $8 for some business. Delivered prices at two steel works are reported 25 to 50 cents higher.

New York—Several eastern steel works have held up scrap shipments following recent heavy arrivals and the scrap trade has entered a period of uncertainty. The price tendency, however, continues firm and the rise on some grades has not halted. Heavy melting steel is unchanged with some easiness in No. 2. On the other hand wrought, cast iron car wheels, grate bars and rails for rolling are stronger.

Philadelphia—While scrap prices generally are unchanged, an easier tone prevails. One large consumer of No. 1 steel has held up shipments and is said to have more than 100 loaded cars on his siding. Two other large consumers had held up shipments, at least in part. The Pencoyd, Pa., consumer of No. 2 steel has dropped his price $1.50 a ton, although no tonnage, it is understood, has been closed at the lower figure. The largest recent purchase fell outside the district, Bethlehem Steel Co. closing on approximately 6000 tons of No. 1 steel at $10.50, delivered, Sparrows Point.

Cincinnati—Quotations on scrap range higher, dealers prices on heavy melting steel being increased 50 cents, at $9.50 to $10, other grades advancing 25 to 50 cents.

Buffalo—A lull has developed in scrap although shipments on contracts continue heavy. Dealers say there is no basis on which to quote but admit the trend is toward fractionally lower levels in several materials.

Detroit—Prices of steel and iron scrap are somewhat weak but there has not been sufficient buying to indicate what level might prevail. A lull in demand is apparent but holders and dealers are not pressing for sales.

St. Louis—Trading in iron and steel scrap is in small volume as offerings are lacking and buyers and sellers can not agree on prices. The situation exhibits great strength, however and melters would increase commitments at their own prices. Melters are specifying heavily on everything under contract.

Birmingham, Ala. — Continued movement of heavy melting steel, No. 1 cast and one or two other items of scrap is noted. Melters of heavy melting steel are buying a little tonnage constantly and receiving shipments steadily.

Wire

Strong Market Is Apparent; Sales Show Decline

Wire Prices, Page 37

Pittsburgh—The market on wire products retains many of its firm features. Orders are slightly fewer but prices are stronger and $5 a ton higher has been applied on new business. The present schedule in carload lots calls for $2.10 per keg on nails, 2.10c on plain wire and 3.10c on spring wire. Woven wire fencing is $55 per column and wire rods $35 per ton. Frequency of less-carload orders from jobbers is especially of note.

Cleveland—Some good miscellaneous orders for wire were received late last week, raising tonnage above the level of the preceding week. Demand, however, is showing a tendency to subside. Plain manufacturers' wire and nails hold at 2.10c.

Chicago—New business in wire products shows a decrease with shipments holding fairly well. Manufacturers' wire is expected to be in lighter demand from the automotive industry next month, the movement recently being fairly steady. Prices of $2.15 for wire nails and 2.15c for plain wire are well maintained.

Boston—While there has been some decline in wire drawing operations, schedules continue at a high rate and an increase in new business is hoped for next month. Mills are making deliveries against contracts and gradually reducing backlogs. Plain wire is firm at 2.20c, Worcester.

Pierce, Butler & Pierce Mfg. Co., manufacturer of radiators, has resumed operations at its foundry at Huntingdon, Pa., after idleness of more than two years. About 150 men are given employment.

MORGAN
WORCESTER

Rolling Mills
Wire Mill Machinery
Producer Gas Machines
Combustion Control

Morgan Construction Company
Worcester, Mass.

European Representative
INTERNATIONAL CONSTRUCTION CO.
56 Kingsway, London, W. C. 2
England

Warehouse

Many Prices Are Advanced; Buying Holds Good Rate

Pittsburgh—Orders continue small in practically all finished steel products. Prices are unchanged although turned and ground shafting probably will be advanced $5 a ton. Several warehouse interests, while adopting the new quantity differentials, feel that the bracket from 400 to 3999 pounds is too inclusive for one base.

Boston—Practically all Boston steel warehouse quotations have been revised, due to advances or to new quantity differentials. Volume is unchanged and buying well distributed.

Cleveland — Warehouse business here is easing up, though volume booked so far this month still is slightly ahead of the comparable period in July. Both size and number of orders are falling off. Confusion among small consumers arising out of the industrial code situation is said to be partially responsible for the slower trend.

Chicago—Business is holding well, sales comparing favorably with the July rate. Higher prices resulting from the new quantity differentials represent the first advance in bars, shapes and plates since 1923. No additional price changes are noted.

Philadelphia — While warehouse quantity differentials are unchanged, jobbers having not yet taken the action of those in some other districts, most base prices have been advanced $3 a ton, with plates, shapes and bars now 2.60c and steel bands at 2.90c.

New York—Steel prices out of warehouse are unchanged following the recent rise in some products. Volume is steady with most jobbers, although one of the largest was about 10 per cent ahead of July during the first half of August.

Detroit—Demand for warehouse steel continues generally unchanged. Business while steady, appears to be on a dead center. Contrary to usual mid-August activity, there is practically no demand from tool and die shops. New quantity differentials and higher prices on cold-drawn bars and galvanized sheets are in effect.

Cincinnati—Warehouse demand is holding up well, with merely a hint of seasonal dullness. No effect on tonnage has yet been noted by the new quantity differentials. Prices are unchanged.

St. Louis—Aside from an advance of $2 per ton on blue annealed sheets warehouse prices are firm and unchanged. Demand continues active, seasonal factors having failed thus far to cause any recession in sales volume.

Warehouse Quotations at Leading Centers, in Cents Per Pound

(All Philadelphia prices subject to quantity differentials, except reinforcing and Swedish bars)

STEEL BARS □

Baltimore*	2.45c
Boston††	2.65c
Buffalo	2.95c
Chattanooga	3.00c
Chicago	2.75c
Cincinnati	3.00c
Cleveland	2.75c
Detroit	2.85c
Houston	2.40c
Los Ang.	3.30c
New Orleans	2.65c
New York‡ (d)	3.10c
Philadelphia...	2.60c
Pittsburgh	2.60c
Portland	3.15c
San Fran.	3.15c
Seattle	3.15c
St. Louis	3.00c
St. Paul	3.00c
Tulsa	3.25c

IRON BARS □

Baltimore	2.35c
Boston††	2.85c
Chattanooga	3.00c
Chicago	2.75c
Cincinnati	3.00c
Detroit	2.85c
New York‡(d)	3.10c
Philadelphia...	2.60c
St. Louis	3.00c
Tulsa	3.25c

REINFORC. BARS □

Baltimore	2.35c-3.00c
Boston	3.10c-3.25c
Buffalo	2.95c
Chattanooga	3.00c
Cincinnati	3.00c
Cleveland	2.00c-2.45c
Detroit	2.85c
Houston	3.00c
Los Ang. cl.	2.10c
New Orleans	2.75c
Los Ang., lcl	2.40c
New York	2.65c-3.10c
Phila.	2.62½c
Pittsburgh	2.60c
San Fran. cl.	2.00c
San Fran. lcl	2.40c
Seattle	3.15c
St. Louis	3.15c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES □

Baltimore*	2.45c
Boston††	2.75c
Buffalo	3.20c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland	2.95c
Detroit	3.10c
Houston	2.65c
Los Ang.	3.30c
New Orleans	3.50c
New York(d)	3.10c
Philadelphia...	2.60c
Pittsburgh	2.85c
Portland	3.15c
San Fran.	3.15c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.25c
Tulsa	3.50c

PLATES □

Baltimore*	2.45c
Boston††	2.75c
Buffalo	3.20c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland, ¼ in. and thicker	2.95c
Cleve., 3/16-in	3.20c
Detroit	3.10c
Det., 3/16-in.	3.10c
Houston	3.00c
Los Angeles	3.30c
New Orleans	3.50c
New York (d)	3.30c
Philadelphia...	2.60c
Phila. floor	4.35c
Pittsburgh	2.85c
Portland	3.15c
San Fran.	2.80c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.25c
Tulsa	3.50c

NO. 10 BLUE □

Baltimore*	2.70c
Boston††	2.50c
Buffalo	3.10c
Chattanooga	3.44c
Chicago	2.85c
Cincinnati	3.05c
Cleveland	2.75c
Det., 8-10 ga.	2.90c
Houston	3.35c
Los Ang.	3.40c
New Orleans	3.25c
New York	3.00c
Portland	3.75c
Philadelphia...	2.75c
Pitts.**	2.75c
San Fran.	3.33c
Seattle	3.75c
St. Louis	3.10c-3.25c
St. Paul	3.45c
Tulsa	3.70c

NO. 24 BLACK □

Balt.*†	3.25c
Boston††	3.60c
Buffalo	3.25c
Chattanooga	3.50c
Chicago	3.45c
Cincinnati	3.60c
Cleveland	3.25c
Detroit	3.30c
Los Ang.	3.80c
New York	3.65c
Philadelphia...	3.30c
Pitts.**	3.40c
Portland	4.50c
San Fran.	3.95c
Seattle	4.50c
St. Louis	3.70c
St. Paul	3.695c
Tulsa	4.75c

NO. 24 GAL. SHEETS □

Balt.*†	3.75c
Buffalo	4.00c
Boston††	4.15c
Chattanooga	3.95c
Chicago	4.00c-4.10c
Cincinnati	4.15c
Cleveland	3.85c
Detroit	3.85c
Houston	3.57c
Los Ang.	4.00c
New Orleans	4.25c
New York	4.00c
Pitts.**	3.75c-4.00c
Portland	5.00c
San Fran.	4.55c
Seattle	5.00c
St. Louis	4.25c
St. Paul	4.19c
Tulsa	5.10c

†BANDS □

Baltimore	2.75c
Boston††	3.15c
Buffalo	3.30c
Chattanooga	3.20c
Chicago	2.95c
Cincinnati	3.20c
Cleveland	3.00c
Det. 3/16-in. & lighter	3.15c
Houston	2.85c
Los Ang.	3.80c
New Orleans	3.00c
New York(d)	3.30c
Philadelphia...	2.90c
Pittsburgh	2.95c
Portland	3.65c
San Fran.	3.15c
Seattle	3.65c
St. Paul	3.20c
Tulsa	3.45c
St. Louis	3.20c

†HOOPS □

Baltimore	2.65c
Boston	4.90c
Buffalo	3.55c
Chicago	3.50c
Cincinnati	3.75c
Det. No. 14 & lighter	3.65c
New York	3.30c
Philadelphia...	3.15c
Pittsburgh	3.60c
Seattle	5.15c
St. Paul	3.75c

COLD FIN. STEEL □

Baltimore (c)	3.33c
Boston (g)	3.70-4.20c
Buffalo	3.00c
Chattanooga*	3.90c
Chicago	3.25c
Cincinnati	3.57c
Clevel'd, flats	3.40c
Do., rounds squares, hexagons	3.25c
Detroit	3.40c
Los Ang.	5.50c
New Orleans	4.25c
New York	3.79c
Philadelphia	3.35c
Pittsburgh	3.20c
Portland (f)	4.50c
San Fran.(d)	5.50c
Seattle (f)	4.50c
St. Paul	3.20c
St. Louis	3.36c
Tulsa	4.65c

COLD ROLL. STRIP □

Boston 0.100 in., 500 lb lots	5.20c
Buffalo	5.25c
Chicago (b)	5.65c
Cincinnati	5.80c
Cleve. (b)	5.55c
Detroit	5.40c
Phila. (c)	4.55c
New York	4.55c

(a) Rounds, hex, only.
(b) Net base straightening, cutting boxing 1 ton or more.
(c) Plus mill, size and quantity extras.
(d) Minus quant. diff.
(e) New mill classif
(f) Rounds only.
(g) Bessemer analysis extras not included

‡Domestic bars.
*Plus quan. extras.
**Under 25 bundles.
*†50 or more bundles.

†New extras apply.

††Base 40,000 lbs., extras on less.

Prices at Detroit, Cleveland, New York, Chicago, Pittsburgh Cincinnati, Chattanooga and St. Louis on heavier lines are subject to new quantity differentials:

399 pounds and less, up 50 cents; 400 to 3999 pounds, base; 4000 to 7999 pounds, 15 cents off; 8000 to 14,999 pounds, 30 cents off; 15,000 to 39,999 pounds, 50 cents off; 40,000 pounds and over, 60 cents off.

Pacific Coast

Dam Project Promises Large Steel Tonnages—Work Is To Start at Once—Building Is At Faster Rate Than Year Ago—Reinforcing Bars Pending In Substantial Lots

San Francisco—(*By Air Mail*)—Although bookings were not heavy during the past week, general business conditions have improved considerably. Building operations on the Pacific coast have increased at least 50 per cent over the total for July, 1932.

Concrete bar lettings aggregated 1613 tons. Concrete Engineering Co. took 1108 tons for Los Angeles and the Colorado Fuel & Iron Co. secured 177 tons for Boulder dam. Bids have been opened on 4100 tons for Boulder dam. Bids will be called for soon for 1000 tons for the White Point outfall sewer for Los Angeles. Out-of-stock prices in the San Francisco section continue unchanged at 2.05c, base, on carload lots.

Awards of structural shapes aggregated 783 tons. The largest letting went to the Judson Pacific Co., 150 tons for a plant for the American Brakeshoe Foundry Co. at South San Francisco. Unnamed interests took over 100 tons for highway work in Clark county, Utah. Los Angeles opened bids Aug. 14 for 250 tons. Over 600 tons are involved in the Broadway tunnel, Oakland, Calif. Plain structural shapes are firm at 2.10c, c.i.f., with wide flange material quoted at 2.20c.

No cast iron pipe lettings of size were noted. Oakland, Calif., has opened bids on close to 2100 tons. Los Angeles county has taken bids on 210 tons for the fair grounds at Pomona, Calif. Ventura, Calif., will soon take bids on 198 tons of 10 to 16-inch pipe. Western Gas Co., El Paso, Tex., will start construction of 253 miles of 10¾-inch gas line pipe from Douglas to Tucson, Ariz., within the next month. Contracts have been made for 10,000 tons of welded steel pipe from A. O. Smith Corp., Milwaukee, and 1500 tons from Youngstown Sheet & Tube Co., Youngstown, O.

Dam Is Biggest Project

Seattle—Pacific Northwest interest centers in the proposed 145-foot low dam at Grand Coulee, Wash., for which the government has allocated $63,000,000. James O'Sullivan, secretary of the state Columbia basin commission, announces bids will be immediately called for drilling and preliminary engineering surveys to cost $150,000. Extension of the Northern Pacific and construction of a bridge across the river are also preliminary projects. Estimates for the low dam total 87,600 tons of reinforcing and miscellaneous steel. Later it is proposed to raise the dam, which involves 129,903 tons additional of iron and steel. Frank A. Banks, reclamation engineer, is in charge of the final surveys and engineering studies.

Awards this week totaled close to 1000 tons, including 318 tons of tie plates for the Alaska railroad, taken by the Pacific Coast Steel Corp., Seattle. Pacific Car & Foundry Co., Seattle, booked 125 tons of shapes for an addition to the Port Townsend, Wash., plant of the National Paper Products Co. and two pontoons for a mining company at Fairbanks, Alaska. The same firm is

(*Please turn to Page* 53)

Steel in Europe

British Trade Shows Growth; Exports Gain, Imports Less

London — (*By Radio*) — Seasonal quiet prevails in the Middlesbrough district, with anticipation high, owing to many negotiations for forward buying. Steel trade volume is growing gradually. Pig iron exports face strong Continental competition. Denmark and Finland have placed orders for rails. Scottish trade is sluggish. In the Birmingham district production is being resumed following the holidays and confidence is growing.

Production figures for July show almost no change, a slight loss being made in both pig iron and steel. Pig iron production in July was 343,900 tons, compared with 345,600 tons in June; steel ingot production in July was 567,500 tons, compared with 568,800 tons in June. Imports declined from 69,019 tons in June to 63,434 tons in July and exports rose from 153,787 tons in June to 156,143 tons in July.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Aug. 17

Export Prices f.o.b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports		Continental Channel or North Sea ports, metric tons Gold parity, $4.8665	
		£ s d		£ s d
PIG IRON				
Foundry, 2.50-3.00 Silicon	$13.02	2 18 6	$8.27	1 14 0
Basic bessemer	12.02	2 14 0*	7.30	1 10 0
Hematite, Phos. .03-.05	13.13	2 19 0	....	.....
SEMIFINISHED STEEL				
Billets	$22.25	5 0 0	$11.44	2 7 0
Wire rods, No. 5 gage	33.38	7 10 0	21.90	4 10 0
FINISHED STEEL				
Standard rails	$34.49	7 15 0	$26.77	5 10 0
Merchant bars	1.32c	6 12 6	.66c	3 0 0
Structural shapes	1.47c	7 7 6	.61c	2 15 0
Plates, †¼ in. or 5 mm.	1.64c	8 5 0	.86c	3 18 6
Sheets, black, 24 gage or 0.5 mm.	1.79c	9 0 0	1.27c	5 15 0
Sheets, gal., 24 gage, corr.	2.19c	11 0 0	1.60c	7 5 0
Bands and strips	1.54c	7 15 0	.83c	3 15 0
Plain wire, base	1.74c	8 15 0	1.18c	5 7 6
Galvanized wire, base	2.09c	10 10 0	1.38c to 1.40c	6 5 6 to 6 7 6
Wire nails, base	2.39c	12 0 0	1.27c	5 15 0
Tin plate, box 108 lbs.	$ 3.78	0 17 0	.....	.....

British ferromanganese $68 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d ($45.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

		£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$13.91	3 2 6(a)*	$11.11	210	$11.34	300	$20.19	63
Basic bessemer pig iron	13.13	2 19 0(a)	10.28	195	8.69	230	22.27	69.50
Furnace coke	2.95	0 13 3	6.34	120	4.16	110	6.17	19.25
Billets	22.25	5 0 0	21.38	405	16.63	440	30.93	96.50
Standard rails	1.64c	8 5 0	1.67c	697	1.87c	1,100(b)	1.91c	132
Merchant bars	1.37c	6 17 6	1.34c	560	.91c	535	1.60c	110
Structural shapes	1.74c	8 15 0	1.32c	550	.91c	535	1.56c	107.50
Plates, †¼-in. or 5 mm.	1.69c	8 10 0	1.63c	680	1.15c	675	1.84c	127
Sheets, black	1.99c	10 0 0§	2.04c	850‡	1.28c	750‡	2.09c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	2.49c	12 10 0	3.48c	1,450	2.47c	1,450	5.37c	370
Plain wire	1.74c	8 15 0	2.71c	1,130	2.21c	1,300	2.57c	177
Bands and strips	1.89c	9 10 0	1.49c	620	1.15c	675	1.84c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel. a del. Middlesbrough. b Since January

Nonferrous Mill Products

Base price cents per pound f.o.b. mill except otherwise specified. Copper and brass product prices based on 9.00c, Conn., for copper

Sheets	
Yellow brass (high)	14.75
Copper, hot rolled	17.12½
Lead sheets, cut to jobbers	8.25
Zinc sheets (100-lb. base)	9.00
Tubes and Pipes	
Seamless yellow brass (high)	16.37½
Seamless copper	16.62½
Rods	
Yellow brass (high, full turnings)	12.25
Naval brass	13.37½
Anodes	
Copper, untrimmed	14.50
Wire	
Yellow brass (high)	14.75

Old Metals

Dealers' buying prices, cents lb

No. 1 Composition Red Brass	
New York	5.00 to 5.25
Chicago	4.75 to 5.00
Cleveland	5.50 to 5.75
St. Louis	4.50 to 4.75
Heavy Yellow Brass	
New York	3.75 to 4.00
Heavy Copper and Wire	
New York	6.75 to 7.00
Chicago, No. 1	6.37½ to 6.62½
Cleveland	5.75 to 6.25
St. Louis	5.50 to 6.00
Composition Brass Borings	
New York	4.75 to 5.00
Yellow Brass Tubing	
Cleveland	4.00 to 4.50
Light Copper	
New York	5.50 to 5.75
Chicago	5.12½ to 5.37½
Cleveland	5.25 to 5.50
St. Louis	5.00
Light Brass	
Chicago	3.00 to 3.25
Cleveland	3.00 to 3.50
St. Louis	2.75 to 3.00
Lead	
New York	3.50 to 3.62½
Cleveland	3.00 to 3.50
Chicago	3.25 to 3.50
St. Louis	3.25 to 3.50
Zinc	
New York	2.25 to 2.50
Cleveland	2.25 to 2.75
Chicago	2.50 to 2.75
St. Louis	2.75 to 3.00
Aluminum	
Clippings, new, soft, Cleve.	13.00 to 14.50
Clippings, hard, Cleveland	9.00 to 10.00
Borings, Cleveland	5.00 to 6.00
Mixed cast, Cleveland	8.00 to 8.50
Mixed cast, St. Louis	8.00 to 8.50

Secondary Metals

Brass ingot, 85-5-5-5	9.00
Remelt aluminum No. 12	12.50 to 13.50

Metals

Prices Fairly Steady Despite Uncertainty Engendered With Regard to Outcome of Codes

New York — Nonferrous metal prices held fairly steady during the past week despite the continuance of uncertainty regarding the outcome of trade practice codes.

Copper—The mine producers presented a revised code of fair competition to the Recovery administration in Washington. This was signed by a majority of the mining producers and calls for graduated control of production from 20 to 30 per cent of capacity, depending on the size of the company and on mining factors. The custom smelters with somewhat different problems have submitted a separate code but the administration declares that it will attempt to bring the entire industry under a single plan. Despite the prospects for higher prices under the code, custom smelter copper was reported sold quietly at the middle of the week at 8.75c. A drop in the value of the dollar abroad late in the week accompanied by higher commodity prices in this country, however, resulted in a return to the 9-cent level. Copper sales in general were light and mostly for fourth quarter delivery. Foreign prices slipped below 8.00c but recovered later in the week.

Lead—The market showed little change. New buying was quiet but shipments continued in good volum which gave the market a steady appearance. September consumer requirements are only about one-third covered. Surplus stocks dropped more than 20,000 tons during July.

Zinc—Little test of the market was evident and late in the week some easiness developed. Most sellers held prime western metal at 5.90c, East St. Louis, however, pending further developments. The feeling the market is due for generally higher prices persisted.

Tin—Prices continued to slip lower up to Thursday when a sharp drop in the value of the dollar abroad sent the market higher. Light to moderate business was done in Straits and English refined metal. Tin continued to move into consumption in fair tonnage.

Aluminum—Demand was quiet with prices unchanged.

Distillates Scarcer; Firm

New York—Distillate prices are firm and unchanged, with demand absorbing current output. Distributors are pushed to meet contract specifications on toluol. The strike in the coal and coke regions retarded the flow of toluol slightly. A tight market also exists for xylol and solvent naphtha. Phenol sells steadily in small lots. Naphthalene is slightly more active.

Coke By-Products

	Spot
Per Gallon Producers' Plants, Tank Lots	
Pure benzol	$0.22
90 per cent benzol	0.22
Toluol	0.30
Solvent naphtha	0.26
Commercial xylol	0.26
Per Pound at Producers' Plants in 250-Pound Drums	
Phenol	0.153 to 0.173
Per Pound at Producers' Plants	
Naphthalene flakes	4.75 to 5.75
Naphthalene balls	4.75 to 5.75
Per 100 Pounds Atlantic Seaboard	
Sulphate of ammonia	$1.20

Quicksilver Quiet

New York—Quicksilver prices continue steady at $64 to $65 a virgin flask of 76 pounds on small lots and $62 on round lots. Inquiry is light. Recent imports of foreign quicksilver have totaled 587 flask, of which 37 flasks were billed to the General Electric Co., Schenectady, N. Y.

Nonferrous Metal Prices of the Week, Cents a Pound

Spot unless otherwise specified

	Copper			Straits Tin		Lead	Lead	Zinc	Aluminum	Antimony	Ingot
	Electro., del. Conn.	Lake, del. Midwest	Casting, refinery	New York Spot	New York Futures	N. Y.	East St. L.	St. L.	98-99%	Spot, N. Y.	Nickel
Aug. 12	9.00	9.12½	8.75	44.60	44.90	4.50	4.35	5.00	*22.90	7.00	35.00
Aug. 14	9.00	9.12½	8.75	44.10	44.40	4.50	4.35	5.00	*22.90	7.00	35.00
Aug. 15	9.00	9.12½	8.75	43.65	43.90	4.50	4.35	5.00	*22.90	7.00	35.00
Aug. 16	9.00	9.12½	8.75	43.45	43.70	4.50	4.35	5.00	*22.90	7.00	35.00
Aug. 17	9.00	9.12½	8.75	44.40	44.65	4.50	4.35	4.97½	*22.90	6.87½	35.00
Aug. 18	9.00	9.12½	8.75	44.75	45.00	4.50	4.35	4.90	*22.90	6.87½	35.00

*Nominal quotation. Market range 19.90c to 22.90c

Equipment

Large Inquiries Lacking as Fall Buying Approaches

New York—A fair volume of miscellaneous equipment is being placed and figured. Mild improvement in demand for equipment which started late last spring has been fairly well maintained, although there have been no large single purchases. Good demand is noted for the heavier type of used machinery. An oil company has purchased seven tools for installation in a Texas shop, including a lathe, shaper, drill and milling machine. On a list of about 25 tools for tne New York fire department repair shops, 47 bidders submitted figures for various items.

Boston—Machine building and metalworking plants in New England are adjusting schedules in line with the shorter work week and with the employment of an additional shift in cases where business warrants. Demand for equipment is unchanged, improvement of the early summer holding generally without the usual midsummer slump. Considerable volume has been figured which may develop into orders this fall. Textile machinery builders continue active. Bids close Aug. 29 on four grinders, including a vertical spindle surface grinder and three universal toolroom cutter grinders, for the Newport, R. I., naval station shops.

Chicago—Machinery and equipment sales lack improvement, sellers still noting hesitancy in closing on old inquiries and in the issuing of new ones. Demand for repair parts also is less active than in June or July. Only a moderate volume of business is pending and some delay is anticipated in the making of contemplated purchases prior to the elimination of uncertainty prevailing over the outcome of the recovery program. Railroad purchases of machinery are almost entirely lacking here, while orders from steel companies are confined principally to one mill. A new maintenance shop for the latter will require several lathes, grinders and a shaper, in addition to other tools placed recently.

Cleveland—Sales have leveled off in the past week or two but continue in fair volume, made up mostly of small orders. Some manufacturing plants have held up equipment orders pending outcome of labor problems in connection with NRA codes. Moderate demand for used tools continues. Inquiries are fewer, with apparently no large lists in prospect. Quotations are made subject to change without notice.

Here and There In Industry

COMBUSTION ENGINEERING CO. INC., 200 Madison avenue, New York, recently formed, has taken over the properties of International Combustion Engineering Corp. and affiliated companies, recently sold by order of the federal court. These companies include Combustion Engineering Corp., Hedges-Walsh-Weidner Co., Coshocton Iron Co. and Raymond Bros. Impact Pulverizer Co. The properties will be operated under a single centralized management. The full line of equipment will be continued in production. The same engineering personnel and manufacturing facilities will be continued. Officers of the new company are: President, Frederick A. Schaff; executive vice president, Joseph V. Santry; vice president in charge of sales, Robert M. Gates; vice president in charge of production, Martens H. Isenberg; vice president in charge of engineering, John VanBrunt; treasurer, Harold H. Berry; secretary and assistant treasurer, George W. Grove; comptroller, George D. Ellis.

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American Smelting & Refining Co., New York, has raised wages 10 per cent for 500 employes at its smelter at Tacoma, Wash., effective Aug. 7. Eugene White is manager.

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Frank Foundries, Moline, Ill., has increased wages 15 per cent and has employed 25 additional men at its plant as a result of increased demand for its products.

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Continental Can Co. Inc., New York, has bought the business of the Manion Steel Barrel Co., Rouseville, Pa., including inventory and can-making and lithographing equipment.

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Plant of the former Tennent Steel Casting Co., Tacoma, Wash., now in control of the Western Steel Casting Co., a reorganization of the former company, has been put in operation after idleness of 14 months. Orders on hand provide capacity operation for some time.

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Keith Dunham Co., Chicago, M. Keith Dunham, president, will build a plant for the production of oxygen at Cleveland adjacent to that of its subsidiary, Gas Products Co., producer of acetylene. The plant will cost about $100,000. A site of five acres has been acquired.

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Simmons Mfg. Co., Cleveland, manufacturer of automotive parts and accessories, has bought the former plant of the Superior Screw & Bolt Mfg. Co., containing about 100,000 square feet of manufacturing space, and will move from its present plant at once. Charles F. Groth is president.

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A. O. Smith Corp., Milwaukee, recalled 977 men to work during July and entered August with a payroll of 4028 in the automobile frame and steel beer barrel divisions. Low point of employment by this firm was 1400 men in March, 1933. The alltime high was 7900 men in 1929.

Men of Industry

(*Concluded from Page* 19)

quarters to the company's Toledo, O., plant, where the executive offices are located.

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Mead F. Moore, chief engineer, Racine division, Nash Motors Co., Kenosha, Wis., has been advanced to chief engineer of all plants, under N. E. Wahlberg, vice president in charge of engineering.

Pacific Coast Markets

(*Concluded from Page* 51)

also building seventy-five 50-foot logging flat cars for the Weyerhaeuser Timber Co., Tacoma, Wash., involving about 150 tons of axles, shapes and plates. On a bid of $440,000, complete, delivery May 1, 1934, Northland Transportation Co., Seattle, has awarded to the Lake Washington Shipyards, Seattle, the contract to build a 231-foot combination steel passenger and freight motorship. The job involves 825 tons of shapes and plates, not yet placed.

Steel Fabricators Inc., Seattle, has furnished 85 to 100 tons of shapes for the Longacres race track stadium, near Seattle.

Awards of 1112 tons of cast iron for Denny Way, Seattle, is still pending. For 250 tons of 10 and 18-inch cast iron pipe for McNeil federal prison, Washington, Universal Pipe & Radiator Co., New York, was low, but American Cast Iron Pipe Co., Birmingham, Ala., was low under specifications. Award is pending.

Construction and Enterprise

New England

KEENE, N. H.—Delay Mfg. Co., Davis street, has let a contract to Glenroy W. Scott, 28 Washington street, for a 1-story addition and boiler plant 30 x 80 feet and 35 x 104 feet, to cost about $50,000.

MATTAPAN, MASS.—D. R. Campbell Machine Co., 55 Mildred avenue, has let a contract to C. C. Temple, 2 Park Square building, Boston, for a 2-story manufacturing addition, 40 x 90 feet.

PROVIDENCE, R. I.—Acme Tank & Welding Works has been incorporated with 1000 shares no par value to manufacture metal products, by W. J. G. Lawton and associates.

New York

GENEVA, N. Y.—Summit Stoves Inc. has been incorporated with $200,000 capital as a reorganization of Summit Foundry Co., which has been in receivership.

LOCKPORT, N. Y.—Assets of the Covert Gear & Mfg. Co., Lockport, have been ordered sold under receivership in the federal court, Aug. 23.

NEW YORK—A. P. Williams Bronze & Iron Co. Inc., 324 Madison avenue, has been incorporated with $40,000 capital to manufacture metal products, by Mordecai Kenowitz.

ROCHESTER, N. Y.—Rochester Sash Balance Co has been organized by J. G. O'Brien, Rochester, to manufacture sash weights.

SYRACUSE, N. Y.—Herrick Heating Equipment Co. Inc. has been incorporated with $5000 capital to manufacture heating equipment, by W. R. Smith and associates.

New Jersey

VINELAND, N. J.—Ferro Pipe & Foundry Co. has been incorporated with $100,000 capital to manufacture iron pipe. Tuso & Stanger, Vineland, are correspondents.

Pennsylvania

MEADVILLE, PA.—Hookless Fastener Co. will take bids about Sept. 1 through Wilbur Watson & Associates, architects, 4614 Prospect avenue, Cleveland, for a 3-story plant 60 x 300 feet on Pine street.

Ohio

CANFIELD, O.—City plans construction of a pumping station, wells, elevated steel tank and tower, to cost about $57,000.

CLEVELAND—Keith Dunham Co., Chicago, M. Keith Dunham, president, will build a plant at 3965 Jennings road S. W. for production of oxygen for industrial use, at a cost of about $100,000.

CLEVELAND—Simmons Mfg. Co., 3405 Perkins avenue N. E., has bought a plant at East Ninety-third street and Aetna road S. E., formerly occupied by the Superior Screw & Bolt Mfg. Co. The company has been occupying several scattered buildings. Production will be centered in the new plant. Its products are automotive accessories.

Michigan

DETROIT—Ace Drill Co. has been incorporated with 3000 shares no par value and $30,000 capital to manufacture twist drills, by Robert B. Bleeker, 13835 Jennings avenue.

PETOSKEY, MICH.—City plans construction of an auxiliary power plant adjacent to its present plant at a cost of $10,000.

ST. JOSEPH, MICH.—St. Joe Mullen Container Corp. has been incorporated with $20,000 capital to manufacture containers and receptacles, by C. M. Davis, 618 Main street.

VASSAR, MICH.—Eaton-Erb Foundry Co. has started construction of two new plant units.

Indiana

LOGANSPORT, IND.—Board of public works, W. O. Fiedler, mayor, will open bids Aug. 23 for a boiler of 750 to 800 horsepower capacity, with mechanical stoker, forced draft and superheater, for installation at the municipal electric light and power plant.

Illinois

CHICAGO—United Air Cleaner Co., 9705 Cottage Grove avenue, has been incorporated with 250 shares common stock, by John T. Beatty and associates. Pennish & Rathboum, 11 South Dearborn street, are correspondents.

CHICAGO—Shake Back Corp., 350 West Erie street, has been incorporated with 1000 shares common stock to manufacture electrical appliances, by Chapman & Cutler, correspondents, 111 West Monroe street.

CHICAGO—Simplex Engineering Co., 117 North Desplaines street, has been incorporated with 100 shares common stock to deal in draft control devices for heating plants, by B. L. Haas and associates. Decker & Golden, 111 West Monroe street, are correspondents.

CHICAGO—Jackson Radio Co., 8440 South Chicago avenue, has been incorporated with 10 shares preferred and 60 shares common stock, to manufacture electrical and mechanical devices, by D'Ancona, Pflaum & Kohlsaat, correspondents, 33 North LaSalle street.

CHICAGO—Commercial Products Co., 841 West Washington boulevard, has been incorporated with 450 shares no par value to manufacture and deal in machines, tools and appliances, by Robert S. Halperin and associates. Wilhartz, Hirsch & Schanfarber, 1501 First National Bank building, are correspondents.

PEORIA, ILL.—Regal Metal Products Co., 114 Fayette street, has been incorporated to manufacture metal products, with $75,000 capital, by E. N. Woodruff and associates.

WAUKEGAN, ILL. — Continental Brass Mfg. Co., Waukegan Terminal building, has been incorporated to manufacture brass and bronze products.

Wisconsin

EAU CLAIRE, WIS.—National Pressure Cooker Co., Ball street, will build a foundry and plant addition to cost about $30,000.

FOND DU LAC, WIS.—John F. Ahern Co., of this city, has been awarded a contract for a Spencer boiler and stoker to be installed in the county court house, at cost of $3592.

GREEN BAY, WIS.—Hagemeister Brewing Co. has been organized by Henry F. Hagemeister, 220 South Van Buren street, and associates, to acquire the former Hagemeister brewery, which will be remodeled at cost of about $125,000.

MILWAUKEE—Supreme Steel Treating Corp. has been organized by A. L. Friday, Casper Grill and Harvey Semrow and has opened a shop at 119 West Scott street to specialize in tool steel and die hardening, gear and shaft work.

MILWAUKEE—Arthur Kuesel Coal Co., 808 North Third street, has taken a long term lease of a 550-foot timber dock on Menomonee canal at North Fifth street from the Chicago, Milwaukee, St. Paul & Pacific railroad. It will be equipped as a combination self-unloading and rail-type dock. Equipment is to be bought.

Iowa

COUNCIL BLUFFS, IOWA—Sprague Foundry & Mfg. Co., J. Katelman, manager, has let a contract to P. Peterson, 3413 California street, Omaha, for a 1-story foundry 76 x 104 feet.

Pacific Coast

MOJAVE, CALIF.—Mojave Smelting Co., Reno, Nev., plans construction of a smelter on its property here, to cost about $250,000.

LOS ANGELES—Hollywood Portable Electric Welding Works, 6310 Santa Monica boulevard, Walter Wilham owner, is engaging in the manufacture of portable welding equipment.

HILLSBORO, OREG.—City has voted $250,000 bonds and asks federal loan of $100,000 for construction of a waterworks system. J. R. McGee is city manager.

LA GRANDE, OREG.—Bonds for $257,000 have been voted for improvement of the municipal waterworks and power plant. A. McAllister is city manager.

NORTH BEND, OREG.—Mountain States Power Co., North Bend, plans to remodel its electric power plant at cost of $40,000.

CHEHALIS, WASH.—City commission has decided to ask $130,000 federal funds to rehabilitate the water system, including three miles of 16-inch mains, one mile of 14-inch and nine miles of various sizes of cast iron pipe. This will replace obsolete wood pipe.